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ABSTRACT

This document is volume two of a two-part report on a project designed to develop instruments and procedures for evaluating and assessing the status of vocational education facilities in Indiana. Volume 2 contains seven appendixes of charts, tables, and other related information which accompany the technical report found in volume 1. Appendixes 4-6 constitute the bulk of the document. Appendix 4 is the instruction manual for the school building/site assessment packet. The instruction manual for the "School Building Cost Estimation Model and Computer Programs for Vocational Education Facilities" is found in appendix 5. And appendix 6 contains samples from the assessment packet. (The total assessment packet and instruction manual are found in ERIC document CE 020 202.) (BM)

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ED171911

FINAL REPORT
INSTRUMENTS AND PROCEDURES
FOR
EVALUATING AND ASSESSING THE STATUS OF
VOCATIONAL EDUCATION FACILITIES IN INDIANA

VOLUME II

Prepared by

Dr. Norbert J. Nelson, Project Co-Director
Mr. Thomas P. Morlan, Project Co-Director
Dr. Richard E. Munsterman, Principal Investigator

July 1978

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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CE 020 201

APPENDICES

APPENDIX I

Figure I.1. Flow Chart for Evaluating and Assessing
the Status of Vocational Facilities in
Indiana

Table I.1. Description of Activities on Flow Chart
and Staff Assignments

Table I-1. Description of Activities on Flow Chart and Staff Assignments.

Activity Number	Description of Activity	Staff Assignments
01.1	Define task	(1) (2) 3
01.2	Establish division of responsibilities between contractors	(1) (2)
02.0	Establish reporting procedures required for internal and external communications, or required by funding agency, or required by statute	(1) (2) 3 4
03.1	Flow chart task of project	(4) 1 2 3
03.2	Establish and manage a working budget based upon flow-charted activities	(1) 2 3 4
04.1	Identify staff roles by task/job descriptions	(1) 3 4
04.2	Establish time-lines for products, major steps on flow-chart, visitations, reports, etc., for all staff through M.B.O. procedures	(1) 2 3 4
05.0	Recruit staff, train staff, and orient staff to project responsibilities	(1) 2 3 4
06.1	Establish an information retrieval center for electronic and hardcopy data	(1) 3 4
06.2	Collect, categorize, catalog, retrieve data obtained from in-state and out-of-state repositories	(1) 7 8
07.1	Conduct literature search to establish minimal legal facilities standards for Indiana	(8) 1 2 3 4 5 6
07.2	Conduct literature search to establish recommended facilities standards	(8) 1 2 3 4 5 6 10

Table I-1. Continued.

Activity Number	Description of Activity	Staff Assignments
08.1	Create directories of resource persons: State Advisory Council State Board Voc./Tech. Education Department of Public Instruction Area vocational education directors Comprehensive high school vocational directors University facilities specialists Classroom teachers	(4) 7
08.2	Create directory of all existing vocational education programs in Indiana	(4) 7
09.1	Design Delphi survey instrument	(1) (8) 2 4 7
09.2	Contact a selection of resource persons who are to participate in the Delphi survey	(1) 7
10.0	Liaison with State of Indiana agencies to update on progress made to date: State Advisory Council Vocational Education State Board Voc./Tech. Education Department of Public Instruction	(1) 2 3 4 5 6
11.1	Conduct Delphi survey to establish a definition of an "adequate facility" in terms of each vocational education cluster area	(1) 4 7
11.2	Conduct Delphi survey to tie together concepts of "adequacy" and "cost"	(1) 4 7
12.0	Create the initial on-site instrument for facilities assessment	(2) (10) 1 2 3 4 5 6
13.0	Select adequate facilities by geographical regions, insuring representation from the entire State of Indiana	(6)
14.0	Contact selected vocational program directors to schedule on-site visits to try out the initial evaluative instrument	(6)

Table I-1. Continued.

Activity Number	Description of Activity	Staff Assignments
15.0	Conduct on-site evaluative observations of a sample of "adequate" facilities to establish a quantitative standard of adequacy in Indiana for all vocational education facilities	(2)
16.1	Refine on-site instrument for facilities assessment to make it sufficient to discriminate between minimal, adequate, and recommended facilities	(2) (1) (10) 3 4 5 6
16.2	Field-test improved observation instrument once in each vocational education cluster area in the Lafayette, Indiana locale	(2)
16.3	Perform final revision to on-site instrument for facilities assessment	(2) (10) 1 3 4 5 6
17.1	Contact vocational centers to schedule evaluations of facilities by teams of trained surveyors/appraisers	(1)
17.2	Train teams of surveyors/appraisers in the uses of the on-site instrument for facilities assessment on Purdue campus	(1) (2) 3 11
18.0	Conduct validated (final) observations for the sample of forty representative vocational centers in each of the vocational education cluster areas throughout Indiana	(2) (11) 1 3 4 5
19.1	Create a system of electronic data processing which is compatible with the computer facilities owned by the Department of Public Instruction	(3)
19.2	Write computer programs to tabulate, summarize, and analyze data	(3) (9)
20.0	Create a mathematical cost model for an "adequate facility" in each vocational education cluster area	(3) 10

Table I-1. Continued.

Activity Number	Description of Activity	Staff Assignments
21.1	Transform survey data into EDP formats	(3) (4) (9)
21.2	Analyze state-wide survey data	(3) (4)
22.0	Create mathematical cost model for facilities meeting minimal through recommended standards	(3)
23.0	Report to funding agency and Purdue University administration	(1) 2 3 4 5
24.0	Terminate project staff and budget and close files and records	(1) (2)
25.0	Publish results in national journals and further disseminate findings on a broad scale	1 2 3 4 5 6

ENDPROJECT STAFF IDENTIFICATION CODES

- 1 N. Nelson
- 2 T. Morlan and R.E.R.A.
- 3 R. Munsterman
- 4 R. Cook
- 5 D. Robson
- 6 F. Woerdehoff
- 7 R. Bast
- 8 L. Erb
- 9 ----- (Computer Programmer)
- 10 Consultants
- 11 Surveyor/Appraisers and Trainees

APPENDIX II

- Table II-1. List of Persons in Departments of Public Instruction and State Boards of Vocational-Technical Education Contacted for Information on Guidelines for Vocational Facilities
- Table II-2. List of Professional Associations Concerned with Facilities Planning and/or Vocational Education
- Table II-3. Listing of Materials from National Survey on Vocational Facility Guidelines, Evaluation, and Cost Estimation

Table II-1. List of Persons in Departments of Public Instruction and State Boards of Vocational-Technical Education Contacted for Information on Guidelines for Vocational Facilities.

T. L. Faulkner
Division of Vocational Education
State Department of Education
501 Dexter Avenue
Montgomery, Alabama 36130

Vendell Jackson
Office of Vocational Education
State Department of Education
Alaska Office Building, Pouch F
Juneau, Alaska 99801

Wm. J. Anderson
Division of Vocational Education
State Superintendent Office
Suite 165, State Capitol Building
Phoenix, Arizona 85005

Luther Hardin
Division of Vocational Education
State Department of Education
Little Rock, Arkansas 72201

S. L. Barrett
Assistant Superintendent
Vocational Education
State Department of Education
721 Capital Mall
Sacramento, California 95814

Director of Vocational Education
State Com. Office
201 E. Colfax
Denver, Colorado 80203

Errol Terrell
Division of Vocational Service
State Department of Education
Hartford, Connecticut 06115

Conrad Shuman
Division of Vocational Education
Department of Public Instruction
John Townsend Building
Dover, Delaware 19901

Table II-1. Continued.

Roy D. Iron
State Department of Education
Boise, Idaho 83702

Sherwood Dees
State Superintendent Office
100 N. 1st Street
Springfield, Illinois 62777

Dan Knoloff
Director Career Education
State Superintendent Office Building
Des Moines, Iowa 50319

John E. Snyder
Asst. Comm.
Division of Vocational Education
State Department of Public Instruction
120 E. 10th
Topeka, Kansas 66612

Dr. Carl F. Lamar
State Superindent Office
Frankfort, Kentucky 40601

Kirby K. Awagain
State Superintendent Office
Box 44064
Baton Rouge, Louisiana 70804

Elwood Padham
State Department of Education
Augusta, Maine 04330

Daniel B. Dunham
State Superintendent Office
Box 8717 Baltimore-Washington
International Airport
Baltimore, Maryland 21240

Patrich Weagroff
State Department of Education
182 Tremont Street
Boston, Massachusetts 02111

Addison Hoffs
State Superintendent Office
Lansing, Michigan 48902

Table II-1. Continued.

Director of Vocational Education
State Department of Education
Centennial Building
St. Paul, Minnesota 55101

J. W. Lewis
State Superintendent Office
Sillers State Office Building
Box 771
Jackson, Mississippi 39205

Carl Humphrey
State Department of Education
Jefferson Building
Box 480
Jefferson City, Missouri 65102

Richard Kitzman
Department of Public Instruction
Wisconsin Hall
Madison, Wisconsin 53702

William Nelson
State Department of Public Instruction
Helena, Montana 59601

Glen H. Strain
State Department of Education
Lincoln, Nebraska 68508

Neal Andrews, Jr.
State Comm. Office
Concord, New Hampshire 03301

Stephen Poliacik
State Department of Education
225 State Street
Trenton, New Jersey 08625

Wilma Ludwig
State Superintendent Office
Sante Fe, New Mexico 87501

Robert Sackendorf
State Education Department
State Education Building
31 Washington Avenue
Albany, New York 12234

Table II-1. Continued.

Charles J. Law, Jr.
State Superintendent Office
Raleigh, North Carolina 27602

Carrol E. Burchinal
Department of Public Instruction
Bismarck, North Dakota 58501

Bryl R. Shoemaker
State Superintendent Office
Columbus, Ohio 43215

Bryle Killian
Division of Vocational Education
1515 W. 6th Avenue
Stillwater, Oklahoma 74074

Donald E. Egge
Assistant Superintendent Instructor
State Superintendent Office
Salem, Oregon 97310

Michael Flanagan
Department of Education
Director of Cum. Services
Harrisburg, Pennsylvania 17126

H. W. Stevenson Jr.
Asst. Comm.
Office of Com. of Education
Providence, Rhode Island 02908

L. L. Lewis
State Superintendent Office
Columbia, South Carolina 29202

E. B. Oleson
State Superintendent Office
Pierre, South Dakota 57501

Jonah Fitch
State Comm. Office
Nashville, Tennessee 37219

Richard E. Carlson
Division of Vocational and Technical Education
Department of Health, Education and Welfare
Office of Education
400 Maryland Avenue, S.W.
Washington, D.C. 20202

Table II-1. Continued.

Joe D. Mills
Division of Vocational Education
State Superintendent Office
Tallahassee, Florida 32304

Dr. Russell S. Clark
State Superintendent Office
242 State Office Building
Atlanta, Georgia 30303

Frank N. Kanzaki
State Superintendent Office
Box 2360
Honolulu, Hawaii 96804

Robert Gordon
State Superintendent Office
Austin, Texas 70761

Walter E. Ulrich
State Superintendent Office
Salt Lake City, Utah 84111

Arthur W. Ericson
State Department of Education
Montpelier, Vermont 05602

George S. Orr, Jr.
State Superintendent Office
Richmond, Virginia 23216

Bruce Brannan
State Superintendent Office
Olympia, Washington 98501

C. Burdette
State Department of Education
Charleston, West Virginia 25305

Richard Rowles
State Superintendent Office
Cheyenne, Wyoming 82001

Table II-2. List of Professional Associations Concerned with Facilities Planning and/or Vocational Education.

American Institute of Architects
1735 New York Avenue, N.W.
Washington, D.C. 20006

Council of Educational Facility Planners
29 West Woodruff Avenue
Columbus, Ohio 43210

Educational Facilities Laboratories
850 Third Avenue
New York, New York 10022

International Society of Educational Planners
Mankata State College
Mankata, Minnesota 56001

National Society for Professional Engineers
2029 K Street, N.W.
Washington, D.C. 20006

American Technical Educational Association, Inc.
Box 31
Delmar, New York 12054

American Vocational Association
1510 H Street, N.W.
Washington, D.C. 20005

Department of Vocational Education, NEA
Washburne Trade School
3233 West 31st Street
Chicago, Illinois 60623

Home Economics Education Association, NEA
1201 - 16th Street, N.W.
Washington, D.C. 20036

National Association of State Directors of
Vocational Education
Director of Vocational Education
State Department of Education
Eighth Street Office Building
Richmond, Virginia 23219

National Association of State Supervisors of
Distributive Education
65 South Front Street
Columbus, Ohio 43216

Table II-2. Continued.

National Association of Trade and Technical Schools
2021 L Street, N.W.
Washington, D.C. 20006

National Council of Technical Schools
1835 K Street, N.W.
Washington, D.C. 20006

National Vocational Agricultural Teachers Association
Box 4498
Lincoln, Nebraska 68504

Eugene I. Lehrman
State Board of Vocational, Technical, and Adult Education
4802 Sheboygan Avenue
Madison, Wisconsin 53702

Table II-5. Listing of Materials from National Survey on Vocational Facility Guidelines, Evaluation, and Cost Estimation.

- * Facility Standards
- ** Evaluation Instrument

American Vocational Association

- ** Instruments and Procedures for the Evaluation of Vocational/Technical Education Institutions and Programs. National Study for Accreditation of Vocational/Technical Education. American Vocational Association, Washington.

The pilot test edition of instruments was developed by AVA under a grant from HEW. There are two short sections on facilities and general statements of facility adequacy. It covers all areas of vocational/technical education programs.

California

- * 1. Space and Equipment for Homemaking Education in California High Schools. California State Department of Education. Sacramento, California. 1964.
- * 2. Planning and Equipping Industrial Arts Facilities. California State Department of Education, Sacramento, California. 1971.
- * 3. Planning and Equipping Business Education Classrooms. California State Department of Education. Sacramento, California. 1961.
- * 4. Housing and Equipment for Agriculture Education. California State Department of Education. Sacramento, California. 1958.

All publications provide specific facilities standards for the designated area. They include drawings of floor plans, square footage and association of units. The most recent is 1971; some outdated.

Table II-3. Continued.

Connecticut

- * Guidelines and Space Requirements for the Groton Regional Vocational-Technical School of Groton, Connecticut. Connecticut State Department of Education, Division of Vocational Education, Office of Buildings, and Facilities Planning. Hartford, Connecticut. 1972.

The publication outlines the specific requirements for this particular vocational school, including auto shops, small engine, carpentry, industrial, welding, drafting, blue print, food trades, and health services. It describes the program and the facilities needed to implement.

Georgia

- * 1. Standards for Public Schools of Georgia. State Board of Education. Atlanta, Georgia. 1976.
2. Planning Guide for Construction of High School Vocational Facilities. Georgia State Department of Education. Atlanta, Georgia.

Standards for vocational facilities in comprehensive high schools are included. It provides recommendations for square footage based on class size of 20 and includes most clusters. Statements other than space requirements relate mostly to industrial.

Kentucky

1. Administration Procedures Manual:
Section on vocational facilities.
- * 2. Excerpts from the 1976 State Plan for Vocational Education pertaining to physical facilities.
3. Application for construction of vocational facilities.
4. Standards for vocational facilities as they relate to state accreditation.
- ** 5. Self study evaluation questions for use of local personnel in preparation for state evaluation.
-

Table II-3. Continued.

Michigan

- * Planning Occupational Education Facilities, supplement to School Plant Planning Handbook, Bulletin #412. Michigan Department of Education, October, 1973.

This publication provides recommendations for facilities standards relative to square footage, provision for disadvantaged, acoustics, illumination, atmospheric control and service systems.

Nebraska

- ** 1. State Evaluator's Visitation Report Forms
- a) Trade and industrial education programs
 - b) Cooperative education.
- * 2. Suggestions for All-Purpose Home Economics Laboratory
- a) Facilities
 - b) Equipment
3. Special Vocational Needs
This is a list of questions to be answered in evaluating vocational-educational programs.
4. Instructor Check-Out Sheet for vocational agriculture.
5. Guide Sheet for Assistance to Instructors of Vocational Agriculture

New Hampshire

- * Manual for Planning and Construction of School Buildings. State Department of Education. Concord, New Hampshire. 1975.

This manual covers the full scope of facilities planning and includes standards for instructional space in Chapter 9. Also it contains recommendations for space by curricular areas in Chapter 8 (Including vocational education).

Table II-3. Continued.

New Jersey

- * Vocational - Technical Facility Planning Guide. State Department of Education, Division of Vocational Education. Trenton, New Jersey. 1976.

This guide provides standards and planning aids in the areas of agriculture, office occupations, distributive education, health occupations, home economics, industrial arts, and vocational-technical, as well as a comprehensive treatment of vocational education facilities planning.

Ohio

- * Estimated Space Requirements and Equipment Costs for Vocational Programs. Ohio State Department of Education, Division of Vocational Education. Columbus, Ohio.

This publication suggests square footage requirements and estimates equipment costs for agricultural education, business, distributive education, health occupations, home economics, industrial, and trades programs.

South Carolina

- * Places and Spaces for Learning. State Department of Education. Columbia, South Carolina.

Suggested standards for facilities for all areas of the school program are provided. It includes the following vocational education clusters: office occupations, health occupations, distribute education, home economics, trade and industrial, agriculture, and administration. The vocational education section is bound separately.

Table II-3. Continued.

South Dakota

Computer Output:

1. Report #1: Lists building and rooms in room number sequence with summary information at end of each building.
2. Building add or update coding form with explanation of codes at the top of the page.
3. Report #4: Program category listing by institution.
4. Report #22: Building summary by institution.
5. Report #24: Computes building maintenance cost as a percentage of replacement cost using the University of Texas formula.
6. Report #37: HEGIS Report which provides summary information in several ways.
7. Report #38: Provides a detailed breakdown by program use as outlined in the HEGIS Taxonomy of Instruction.

Washington

1. Building and Equipment for Teaching Vocational Agriculture and Standards for Conducting Such Programs in Washington State. Coordinating Council for Occupational Education. Olympia, Washington. 1975.
2. Business and Office Education - Facility and Equipment Standards. State Superintendent of Public Instruction. Olympia, Washington. 1976.
3. Distributive Education Classroom and Laboratory. State Superintendent of Public Instruction. Olympia, Washington.
4. Facility and Curriculum Guidelines for High School Trade and Industrial Education Auto Body and Fender. State Superintendent of Public Instruction. Olympia, Washington.

Table II-3. Continued.

Washington (Continued)

5. Guidelines for Child Development Laboratories.
Coordinating Council for Occupational Education.
Olympia, Washington. 1974.

West Virginia

- * 1. Handbook on Planning School Facilities. West
Virginia Department of Education. Charleston,
West Virginia. 1973.
 - ** 2. Program Evaluation Instruments for Electronics
Technology, Cooperative Vocational Education,
Comprehensive Home Economics, Stenographic-Secre-
tarial, accounting and Computing, Practical Nursing,
Agricultural Production, and Welding. West Virginia
Department of Education. Charleston, West Virginia.
-

APPENDIX III

- Table III-1. Sample of the Modified Delphi Instrument Sent to Panelists for the Business Education Cluster.
- Table III-2. Information Sent to Potential Panelists for the Modified Delphi Study.
- Table III-3. Round II of Modified Delphi Instrument Sent to Panelists for the Business Education Cluster.

Table III-1. Sample of the Modified Delphi Instrument Sent to Panelists for the Business Education Cluster.

VOCATIONAL CLUSTER

Instructions: In this instrument are descriptive statements about adequate vocational education facilities for high school students. Some of the statements present quantitative information and others present qualitative information. To each of these statements you are asked to make responses relative to agreement and importance.

AGREEMENT -- Conforms to acceptable standards for vocational education.

1. Yes - I agree with the statement as written.
2. No - I disagree with the statement as written and would make the following changes.

IMPORTANCE -- Please indicate the importance of each item in defining adequate vocational facilities. A scale of one (1) to three (3) will be used as follows. Circle your response.

1. This item is not needed.
2. This item is desirable but not essential.
3. This item is essential.

EXAMPLE 1. Business Education laboratories should be air conditioned.

Yes ☐ No ☐ Change _____ IMPORTANCE: 1 2 3

EXAMPLE 2. The Business Machines Area should provide 100 square feet per pupil station.

Yes ☐ No ☐ Change _____ IMPORTANCE: 1 2 3

EXAMPLE 3. Each Business Education Area should include a teacher's office.

Yes ☐ No ☐ Change _____ IMPORTANCE: 1 2 3

BUSINESS EDUCATION

1. A Business Education Suite should contain a classroom, a teacher's office, and a separate laboratory area for each subject offered.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

2. Adequate space provisions for a Business Education Suite are as follows:

- 2.1 - Classroom (30) students) - 750 square feet.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

- 2.2 - Teacher's Office - 150 square feet.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

- 2.3 - Lab for Record Keeping, Bookkeeping, and Business Math (30 students) - 1200 square feet.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

- 2.4 - Lab for Typing I (35 students) - 1200 square feet.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

- 2.5 - Lab for Typing II, Shorthand I and II (30 students) - 1200 square feet.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

- 2.6 - Lab for Office Machines/Office Practice (20 students) - 1200 square feet.

Yes ____ No ____ Change _____ IMPORTANCE: 1 2 3

2.7 - Lab for Keypunch and Data Processing (7-10 Keypunch Machines) - 1050 square feet.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

3. The length to width ratio should approximate 1.5 to 1.0 in all areas.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

4. The Business Education rooms should be arranged in a suite with the Stenography room adjoining the Typing room and the Bookkeeping room adjoining the Business Machines room.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

5. Light intensity at desk level should be at fifty (50) candle power.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

6. Duplex electrical outlets (120 v) should be placed flush with the floor and should be provided for every student station in all labs where machines are used.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

7. 220 volt single phase electrical service should be provided to Business Education labs.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

8. A master electrical switch should be available to control all electrical outlets in each room containing a large number of office machines.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

9. Business machine labs should be provided with temperature and humidity control systems.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

10. Business Education rooms should be carpeted for noise control.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

11. Ceilings of all Business Education rooms should be acoustically treated.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

12. A Business Machines lab should be equipped with a sink with hot and cold water.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

13. The Business Education Department should have a lighted display window facing a high traffic area.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

14. A ceiling height of nine (9) feet is adequate for all Business Education areas.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

15. Convenience electrical outlets (120 v) should be located at eight (8) foot intervals on the walls of each Business Education room.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

16. Noise transfer between units should be controlled through the use of sound-deadening materials on walls.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

17. Personnel doors should connect all classrooms in the Business Education Department.

Yes ☐ No ☐ Change ☐ IMPORTANCE: 1 2 3

18. Please add to this list any standards you consider necessary to make the list more complete.

19. Please suggest some Business Education facilities in Indiana with which you are familiar and which, in your opinion, conform to acceptable standards for vocational education.

THANK YOU VERY MUCH FOR YOUR COOPERATION AND ASSISTANCE

Table III-2. Information Sent to Potential Panelists for the Modified Delphi Study.

**PURDUE
UNIVERSITY** DEPARTMENT OF EDUCATION

Purdue University has a contract with the Indiana State Advisory Council for Vocational Education to conduct a research project on "Assessing and Evaluating the Status of Vocational Education Facilities in Indiana." I am co-director of this project along with Thomas P. Morlan of R.E. Research Associates. This letter is being written to request your assistance in the project. A one page summary which explains the study is enclosed.

Instruments will need to be developed to use in assessing and evaluating vocational facilities for high school students. One instrument will be used to measure adequate facilities. It will include sections to use with the various vocational clusters (e.g., Agribusiness, Business Education). A second instrument will deal with cost considerations. In developing the instrument for use in assessing and evaluating vocational facilities, a modified Delphi study will be conducted. A statement that explains the Delphi Technique is enclosed.

I would like for you to serve as one of the panelists. Past experience with the Delphi Technique suggests that it usually requires fewer than 30 minutes to complete the instrument. I would appreciate it if you would complete and return the enclosed post card at your earliest convenience. If you have any questions, please contact me (317-749-2697).

When our Delphi panels are complete, those of you who have agreed to participate will receive directions and materials. Thank you.

Sincerely yours,

Norbert J. Nelson
Co-Director of Voc. Ed. Facility Project
Educational Administration, Curriculum
and Supervision
F-15 South Campus Courts
Purdue University

Enclosures
NJN/rp



West Lafayette, Indiana 47907

Table III-2. Continued.

A MODIFIED DELPHI TECHNIQUE

Effective planning for the future is greatly aided where knowledgeable persons describe and assign value to specific events and/or ideas. The Delphi Technique is one of the approaches used for forecasting and describing events and ideas. Since its inception in the late fifties, the technique has been tested and found to be reliable by business, government, and military organizations.

Because of the nature of certain activities, absolute answers derived from an exact scientific study are not possible. Many decisions hence must be based on other than vigorous scientific evidence. The considered beliefs of experts, specialists, and informed persons tend to be the next most reliable source for answers. Since a single person might err, reliability is increased as more experts, specialists, and informed persons are consulted. The committee approach, with face-to-face contacts, has certain draw backs which make it difficult to secure objective judgments and evaluations. A committee decision is often a compromise rather than a consensus. In the Delphi these draw backs are minimized by using unidentified panelists to respond to instruments.

Panelists are requested to respond to statements and submit additional ones that are deemed important and have not been included. Panelists also may change the original statements and indicate why. Special insights perhaps not shared by other panelists may be reasons for suggesting modifications, changes, or eliminations of statements. The modified instrument is returned to the panelists seeking responses. If after the second return, consensus has not been reached, the instrument is again modified and re-submitted to the panelists. Consensus in a Delphi means a collective viewpoint indicating general agreement and accord.

In this research, instruments will be developed to assess vocational educational facilities in Indiana. One of the inputs to be used in instrument development will be data secured from a modified Delphi study.

Table III-2. Continued.

Norbert J. Nelson
Educational Administration, Curriculum & Supervision
Purdue University
South Campus Courts F-15
West Lafayette, Indiana 47907

Re: Vocational Education Project 0094-64-13555

Date: _____

Please check the appropriate blank:

_____ I will serve as a Delphi panel member.

_____ I will not serve as a Delphi panel member.

_____ Other (specify) _____

Comment: _____

Name: _____

Address: _____

Telephone No: _____

Table III-3. Round II of Modified Delphi Instrument Sent to Panelists for the Business Education Cluster.

BUSINESS EDUCATION

Part I

Instructions: Each of the statements listed in this section are items for which consensus was not reached by the Delphi Panel during the first round of this process. You are asked to respond to the new statement after reviewing the original statement, the percentage value of agreement, and the ranking of importance. For each new item you are asked to make responses relative to agreement or if you disagree to state your reasons in the space provided.

Agreement -- Conforms to acceptable standards for vocational education.

1. Yes - I agree with the new statement as written.
2. No - I disagree with the statement as written for the following reasons.

1. Original Statement: A Business Education Suite should contain a classroom, a teacher's office, and a separate laboratory area for each subject offered.

Percentage of Agreement: 50% - Level of Importance: Desirable but not essential.

New Statement: A Business Education Suite should contain a classroom, a teacher's office and a multi-purpose laboratory which will serve each subject offered.

Yes _____ No _____ Change _____

Table III-3. Continued.

BUSINESS EDUCATION

2. Original Statement: Lab for Keypunch and Data Processing (7-10 Keypunch Machines) - 1050 square feet.

Percentage of Agreement: 60% - Level of Importance: Desirable but not essential.

New Statement: Lab for Keypunch and Data Processing should be 1200 square feet.

Yes ____ No ____ Change _____

3. Original Statement: Light intensity at desk level should be fifty (50) candle power.

Percentage of Agreement: 40% - Level of Importance: Essential.

New Statement: Light intensity at desk level should be seventy (70) candle power.

Yes ____ No ____ Change _____

Table III-3. Continued.

BUSINESS EDUCATION

4. Original Statement: Convenience electrical outlets (120 v) should be located at eight (8) foot intervals on the walls of each Business Education room.

Percentage of Agreement: 50% - Level of Importance: Desirable but not essential.

New Statement: Convenience electrical outlets (120 v) should be located at six (6) foot intervals on the walls of each Business Education room.

Yes ____ No ____ Change _____

5. Original Statement: Personnel doors should connect all classrooms in the Business Education area.

Percentage of Agreement: 40% - Level of Importance: Desirable but not essential.

New Statement: All Business Education rooms should share a common hallway for movement throughout the suite.

Yes ____ No ____ Change _____

Table III-3. Continued.

BUSINESS EDUCATION

Part II

The following statements were added by panelists for defining adequate vocational education facilities. To each of these statements you are asked to make responses relative to agreement and importance.

		<u>IMPORTANCE</u>		
		Not Needed	Desirable	Essent
		1	2	3

1. The Key punch and Data Processing should have telephone jacks for computer terminals.

Yes ____ No ____ Change _____

Table III-3. Continued.

BUSINESS EDUCATION

		<u>IMPORTANCE</u>		
2.	The Business Education areas should have television jacks to a central system or antenna.	Not Needed	Desirable	Essential
		1	2	3
Yes ____ No ____ Change _____				

APPENDIX IV

- Exhibit IV-1. Instruction Manual for School Building/
Site Assessment Packet for Vocational
Education Facilities.
- Exhibit IV-2. Applicability/Validity Checks and
Instrument Review Comments

Exhibit IV-1.

**INSTRUCTION
MANUAL**

**SCHOOL BUILDING/SITE ASSESSMENT PACKET
for
VOCATIONAL EDUCATION FACILITIES**

June, 1978

PREFACE

The School Building/Site Assessment Packet for Vocational Education Facilities is one of the products of the research project "Evaluating and Assessing the Status of Vocational Education Facilities in Indiana." This project was funded through the Indiana State Advisory Council for Vocational Education. One purpose of the project was to develop, field test, and validate instrumentation that could be used in a reliable way to assess the extent of availability, nature of quality, range of acceptance, and potential of convertibility of facilities and fixed equipment for vocational education at the secondary school level. The instrumentation is designed for computer compatibility with existing systems.

The assessment packet is developed as an aid to those responsible for facility planning in vocational education. It aims to provide local and state agencies with important and essential information to help them make sound decisions in facility planning. Hopefully, the application of the assessment packet will lead to functional facilities in which to conduct vocational programs at the secondary school level whether the facility be part of a comprehensive high school, be an area vocational school, or be some other arrangement.

The Instruction Manual provides background information, describes meanings, and presents ideas that are pertinent to consider and understand when using the School Building/Site Assessment Packet.

Norbert J. Nelson

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EVALUATION AND ASSESSMENT

In a changing and viable society the need to judge and propose constantly confronts planners and decision makers. Meaningful and relevant data that help establish conditions or project needs are important to those with planning and decision-making responsibilities. Data collection instruments that provide usable input can lead to effective and efficient decisions and plans. Operational meanings are needed for evaluation and assessment. Potential purpose and use of data gathering instruments needs to be understood.

Operationalizing Evaluations and Assessments

Meanings need to be clarified in relation to applying processes and procedures that produce results that can be communicated in a discernible way. If a facility is judged either adequate or inadequate, there must be understood answers to this question: For what and why? It may be, for example, a space is inadequate for a Machine Shop program because the space is narrow, has a low ceiling, has only 110v. power, and so on. An assessment was necessary before a question like the one given could be answered. This means that someone made an appraisal of the space. If a person doing the assessment is knowledgeable and the instrument that records measurements, observations, and judgments is a sound and valid one, there will be confidence in the answer. Equally knowledgeable persons should be able to apply the assessment instrument with similar results. Accurate assessments lead to accurate evaluations. An evaluation ascertains value and fixes worth. For instance, in the example given, a follow-up question might be "Can the space be made adequate for Machine Shop?" The person making the evaluation may conclude the cost to enlarge space dimensions (l x w x h) would be prohibitive. This is an evaluative statement.

The application of the assessment packets will require considerable study

and some preparation if the persons doing the assessing and evaluating are to do competent work. Only then will these persons provide recorded data that can be accurately interpreted by planners and decision makers.

Purposes and Uses of Building/Site Assessment Packet

It may be the aim of applying the Building/Site Assessment Packet is to evaluate the status of existing facilities for purposes of planning a remodeling or renovation program. Or it may be that the intent is to determine whether the available facilities being used for general type occupational oriented courses (e.g., industrial arts) can be adapted to vocational type courses (e.g., trade and industrial). These instruments might be used to help determine whether a facility is worth saving or whether a new facility is needed. Then again, the instruments may be given to school officials and planners who are identifying the elements that ought be considered in buildings and sites for vocational programs. Another purpose might be to have a computer file and record of a facility just as files and records are kept on student populations, finances, and personnel. Careful application of the packets may also provide records of capital assets for local, regional, and state agencies to use in strategic planning with community groups and legislative committees. In other words, there are many purposes for which the packet might prove to be useful.

The goal in using the Building/Site Assessment Packet should be to upgrade physical facilities to better accommodate vocational programs. The intent ought be to provide data and information which can lead to improving and facilitating program developments and operations in vocational education.

ASSISTANCE IN PLANNING

In any aspect of facility planning, it is important to be thoroughly familiar with procedures and ideas. The time spent on pre-planning will pay dividends. In applying a set of instruments such as those included in the School Building/Site Assessment Packet, good background study will prove helpful. Summarized in the two sections that follow is information on sources of assistance in planning.

Principal Sources of Assistance in Planning

The two primary governmental agencies to provide assistance in planning educational facilities are the Indiana Department of Public Instruction and the State Board of Vocational and Technical Education. The Department of Public Instruction includes two divisions that are important sources of information about vocational facilities: Schoolhouse Planning and Vocational Education. Available through these offices are building and site standards for Indiana (Schoolhouse Planning) and guidelines for planning vocational facilities (Vocational Education). The State Board of Vocational and Technical Education has responsibilities for governing functions of programs in Indiana that are classified officially as vocational. These programs are operated either as selected vocational programs in comprehensive high schools, vocational-technical high schools, or area vocational schools. The vocational and technical education agency is a good source of information on regulations and standards that need to be met if a program is to be classified as vocational.

In Indiana, public school facility plans need approvals from the DPI Division of Schoolhouse planning, the Administrative Building Council, the Department of Health, the Office of the Fire Marshall, and the State Board of Accounts. Each of these agencies have specific tasks related to facility plans.

Other Sources of Assistance in Planning

There are a variety of governmental and non-governmental agencies that can provide information and assistance in facilities planning. The sources identified are not intended to be exhaustive.

In addition to State of Indiana governmental sources, there are federal sources that provide data and guidelines for planning. In the U.S. Office of Education (Department of Health, Education, and Welfare) there are several bureaus that can provide assistance (e.g., Bureau of Education for the Handicapped, Bureau of Elementary and Secondary Education, Bureau of Occupational and Adult Education). Then, too, in HEW is the Office of Civil Rights. This office monitors several sections of the Vocational-Rehabilitation Act of 1973. The National Institute of Education (NIE) also may provide helpful information. An example of this information is the Facilities Handbook for Career Education.¹ Another federal agency known as OSHA (Occupational Safety and Health Admin) provides safety check lists, guides, code information and the like that are pertinent considerations in planning vocational facilities.

Then, too, there are special associations, councils, and societies that may provide planning information that will be helpful. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE) have documents available that identify standards for energy conservation in building designs. The American Institute of Architects (AIA) has pamphlets available on many facets of building construction. The Educational Facilities Laboratory (EFL) is a non-profit, foundation supported agency that conducts studies relating to buildings and sites and publishes many monographs, bulletins, and reports. The Council of Educational Facilities Planners, International (CEFP) comprised

¹ Gill, W. B. and Like, A. W. Facilities Handbook for Career Education. NIE Papers in Education and Work No. 2 (Washington, D.C.: NIE, U.S. Office of Education, October 1976) 230 pages

of a variety of different type of persons with school facility knowledge (e.g., educational planners, architects, administrators, directors, professors) is an information source that could be helpful in planning. Finally, there are professional associations (e.g., American Council of Industrial Arts Supervisors) that provide information about facilities in specific areas.

ACCOMMODATION OF THE HANDICAPPED

The nature of the design and the type construction of a vocational facility or other public building can greatly affect the ability of handicapped individuals to use the services of that building. Such features as restrooms, stairways, and entrances may effectively serve as barriers to the handicapped. In addition, exterior features of site planning, such as curbs, may also bar individuals from access.

In recent years, since the passage of the Architectural Barriers Act of 1968 (U.S. Code, Title 42, Section 4151 through 4156, Public Law 90-480), a number of state and federal laws have been passed which attempt to eliminate architectural barriers in new buildings. That is, federal statutes have been passed which require all publicly financed buildings or facilities to be accessible to handicapped individuals. Further, section 503 of the Vocational Rehabilitation Act of 1973 mandates that programs which are federally funded must be accessible and that a plan must be prepared which will not only provide for accessibility in new buildings but which will renovate many existing facilities for such accessibility.

Presently there are estimated to be between 18 and 20 million people in the United States with a physical handicap requiring that specially designed architecture of some kind is necessary to accommodate daily living routines.²

Within this population (nearly the size of the State of New York) there is an unemployment rate of approximately 64 percent. As a consequence of such handicaps, individuals are turning to vocational training institutions and institutions of continued or higher education for training to enhance their abilities for functioning in the world of work.

² Cotler, Stephen R. and DeGraff, Alfred H., Architectural Accessibility for the Disabled of College Campuses (New York: State University Construction Fund, 1976)

Categories of Handicapped

While accommodations must be made for the more obvious physically handicapped, accessibility standards also provide for the removal of architectural barrier to other handicapping conditions. Generally considered categories of disability include (a) Non-ambulatory disabilities: Those disabilities which, regardless of cause, confine the individual to wheelchair mobility; (b) Semi-ambulatory disabilities: These include any type of disability which causes the individual to be not secure in walking or to walk with great difficulty. This category includes people with crutches, braces, amputees, etc.; (c) Coordination disabilities: These include impairments of muscle control; (d) Sight disabilities: These disabilities affect sight totally or partially; (e) Hearing disabilities: The inability to communicate or hear warning signals is the primary danger; and (f) Aging disabilities: Disabilities due to manifestations of the aging process which reduce mobility, flexibility, coordination, and perception.

It should be noted that virtually all individuals may, at some time in their lives be subject to such handicapping conditions, even if only temporarily. In addition, such handicapping conditions vary greatly in severity, from the near totally involved to the less seriously affected. It is necessary then to design facilities which will take into account a "realistic degree" of independence. That is, no architectural arrangement would facilitate access for the totally immobile. Thus, even with accommodation, some more severely handicapped persons will confront architectural barriers. Hopefully, however, standards devised will consider a reasonable level of accommodation as weighed against a realistic degree of independence.

Facility Design for the Handicapped

The major legislation affecting facility design for the handicapped is section 503 and 504 of the Vocational Rehabilitation Act of 1973. Rules and

Regulations for that act were only signed into law in 1977. It is important to understand that, although the act anticipates non-discrimination on the basis of handicap in all federally funded programs and facilities, this does not mean that every building and every aspect of every building must be made barrier-free. Certain facility modifications in conjunction with schedule changes, special assistants or aides, and other methods which allow access are also permissible.

The criteria used to determine whether accessibility is achieved are those devised by the American National Standards Institutes (ANSI A117.1 - 1961, R 1971). These standards are detailed and spell out exact minimums in feet and inches.

In general, accessibility concerns both site (exterior) characteristics and structural (interior) characteristics. The more obvious exterior accommodations include, but are not limited to, the following: (a) Parking access: The issue here is convenience. Parking spaces should be located as close to accessible entrances as possible. Such spaces should be reserved and clearly marked. (b) Curb cuts and ramps: Anything that abruptly rises or drops, such as steps or curbs, is a barrier to those with ambulatory problems. ANSI Standards indicate degree of rise for ramps where there are stairs and width of cuts for curbs. (c) Landscaping: Attention should be given to landscaping which is aesthetic but does not inhibit access to the handicapped. (d) Exterior entrances: The issue here is that the accessible entrances should provide for as many kinds of problems as possible. Automatic door openers, doors opening away from users, sufficient space at the top of ramps, sufficient width, textural cues for the blind, and other considerations are important to include.

Once inside the building, the major areas of concern have to do with ability to move throughout the building, ability to take advantage of the facilities which the building offers, and the safety of the handicapped individual. Thus, multiple story buildings will need an elevator, corridors which are of adequate width, and egress and ingress accommodations which facilitate mobility problems. In addition,

drinking fountains, lavatory facilities, and classroom space and equipment installation will need to provide for such limitations. Elevators, for example, will need to be provided with braille indicators to facilitate their use by the blind. Finally, safety must be an overriding concern.

The Access Problem

Ultimately, barrier free considerations may appear costly when viewed on a per user basis, since some schools will have few, if any, such handicapped individuals at the time of renovation or initial construction. It is important to note, however, that failure to provide for such concerns serves as an effective barrier to the handicapped and, thus, denies them access and use of these facilities. Few would argue that the handicapped should be denied such access. Finally, it is important to remember that all individuals are susceptible to handicapping limitations, even if only as temporary conditions associated with post-surgical recovery, broken bones and the consequent need for crutches, or other problems encountered in everyday living. As such, then accessibility affects us all.

ENERGY CONSERVATION

It is of the utmost importance that energy conservation be considered in the assessment of facilities to accommodate vocational-technical education programs. The accessibility and adequacy of the energy source or sources is a high priority consideration in the use of existing facilities and in building, remodeling, and renovating facilities. The selection of facility components (e.g., spatial, thermal, visual, and structural) that lead to energy efficiency is a necessity. As both a scarce and increasingly expensive resource, good management of energy is essential. When assessing facilities attention needs to be directed toward the building envelope to evaluate thermal resistance and air leakage, and, in addition, to evaluate the performance of the electrical, mechanical and other service systems and equipment with regard to efficiency and effectiveness. Energy conservation is the product of providing and maintaining good physical resources that are adequately managed.

Structural Environment

The building envelope is the fabrication treatments (ceilings, floors, and walls) which function to resist and transmit energy to and from the exterior and various interiors. In facility assessment, surfaces and openings (e.g., cracks, pipes, louvers) that provide unwanted air leakage should be checked. Inspected too, should be windows and doors to determine if they fit and work well. Large single pane window areas lack much thermal resistance and their need should be analyzed. Air leakage treatments such as the vestibule and storm sash help reduce energy losses. Their appropriate provision should be checked. The status of building insulation (e.g., roof deck, walls, and under floors) should be inspected to assess adequacy. Then, too, the provision and adequacy of such features as shade covers, awnings, and drapes should be noted.

Thermal Environment

The heating-cooling-ventilating equilibrium of space is a critical energy problem. Equipment operation efficiency needs to be assessed. Automatic controls are essential for efficient operation of equipment. Their availability and workability should be noted. Are there automatic time-switch controls which are available and responsive? Air-fuel adjustments that make for proper firing of equipment ought to be analyzed. Steam pressures that are adequate but not beyond requirements should be checked. Fresh air intakes and power exhausts need to be inspected to ascertain if they are sufficiently controlled to not provide service that is in excess of need. Equipment ought to be checked for operating efficiency (e.g., belt slippage, dirty filters, loose seals). A check should be made of thermostats to determine if they are available and appropriately located to provide thermal flexibility and control. The insulation of piping and air ducts for heating, ventilating, and cooling needs to be evaluated. The HVAC system (heating-ventilating-air conditioning) should be analyzed as to load, design, and control requirements to provide for general comfort with efficient utilization of energy.

Electrical Environment

There are many visual and power tasks with different requirements in operating vocational programs. The provision of electricity to meet visual demands becomes a part of the energy problem. The allowable electric power for handling levels of illumination and equipment operation (e.g., shop, heat) bear on the energy problem. Whether a building is double metered with a separate circuit for the exit lights and alarm systems which would eliminate the first meter demand and usage should be noted. Whether rooms and areas in a building are individually switched with multiple switches should be checked. Time clocks and photo cells to provide for lighting control should be noted. Rooms should be inspected to determine whether color designs are

appropriate to supplement lighting. It should be determined whether fluorescent lighting is used wherever it can be equally effective as incandescent lighting. If lights are positioned to control more by task than area should be noted. The foot-candle levels ought be analyzed so they are meeting minimum standards rather than exceeding maximum standards.

Service Systems

The services requirements for facilities also have energy demands which can be met either efficiently or inefficiently. Vocational facilities need electrical, gas, water, and compressed air services to meet program requirements. These services should be generated and delivered in a manner conducive to saving energy.

If the heating system needs to be operated so domestic hot water is available from the main boilers, there likely exists an inefficient operation as far as energy conservation is concerned. This condition should be investigated. Separate domestic hot water systems are typically more efficient. These systems should be checked to determine if automatic temperature controls are available, if insulation is adequate on the storage tanks and piping, and if pumps can be turned off when hot water is not needed. Conservation practices such as to not heat water beyond 110° F. and equipping fixtures with self-closing valves and other flow control devices should be checked. Whether hot water is being delivered where not required also ought be noted. Where excessively hot water is needed, it should be provided by a separate booster. This should be checked.

All service systems should perform well when needed and not operated unless needed. Master switches and automatic controls should be available to prevent inefficient operation of all services. It is necessary to find out if they are present. Installation of service systems should meet standards such that energy losses do not occur because of improper installation of units.

A leakage in the facility may result from improper installation of service equipment. Also there may be water and compressed air leaks. Although leaks from gas tend to be carefully checked, there could be gas operations that use gas unnecessarily. Such a condition should be noted when evaluating facilities.

Electric power is an important service to shops and labs in vocational facilities. Performance data on power equipment to determine efficiency levels of operation should be analyzed. Such things as full load, partial load, and standby conditions should be checked to determine if there is compliance with standard specifications. Electric equipment should be shut down when not in use. Is it? Power should not be expended unless it is serving a purpose.

SCHOOL BUILDING/SITE ASSESSMENT PACKET

The School Building/Site Assessment Packet is comprised of four basic parts. The first part is General Data about buildings and sites to be evaluated. The second part includes Inspection Forms which note rather specific data that are measurable and observable. Site Assessment is part three of the packet. Special site components are evaluated followed by over-all ratings by completing a form on Recapitulation of Site Assessment. Part four of the packet includes the Building Assessment of nine specific facility components followed by over-all ratings by completing a form on Recapitulation of Building Assessment.

Preliminary information that identifies and codes the data is recorded for the School Building/Site Assessment Packet. If the first two boxes are completed, the ID code for computer use can be completed.

General Data

Basic building and site information is recorded under General Data.

Under building information the gross area (sq. ft.) of the total complex should be noted. If an explanation is needed, this should be noted. For example, you may wish to note whether the area was determined from blue prints, actual measurement, or estimated by pacing distances. Under construction give the date of original construction and purpose (i.e., high school, shop annex). Give dates for any additions to the original structure and the purpose of each addition. Check the type of facility to be assessed and give the number of floors in the building.

Under site information, record the total acres in the site, check the general shape, and whether the site acres are or are not contiguous. The particular status of the site should be noted by a check on the appropriate blank. Indicate the number of buildings (e.g., 0, 1, 2, etc.) on the site

when the assessment was made.

Cost information should note the value in dollars of the site and the building. Then check whether the dollar value is actual (Act.) or estimated (Est.). Explain where appropriate to indicate how the value was established (e.g., prevailing price/acre x no. of acres, insured value of building).

INSPECTION FORM

Aspects of a facility must be examined carefully so that quantitative and empirical data can be reviewed and recorded. The Inspection Form(s) is/are used to provide selected detail of facility areas and spaces (e.g., classroom, laboratory, shop, office). Recording data that are objective (measurable) and empirical (observable) improve validity when assessing subjective features of facilities and when evaluating usability.

Identification Features

Station number refers to the method used to identify and locate a particular station. Usually the method used is a numbering system (1, 2, 3, 4, etc.). Often second floors start with a two (21, 22, 23). Some schools use a letter and number sequence with the letter identifying the location (A-1, A-2, etc.).

Number of student stations refers to the capacity of a room to accommodate a particular class or to seat certain numbers of people. In regular classrooms there perhaps are tables and chairs or arm desks which may seat a certain number (20 students, 30 students). A laboratory may have a set number of individual lab stations (e.g., Electronics Lab - 18 student stations). A shop usually is equipped to accommodate a set number of students (i.e., Auto Mechanics - 16 students).

Spatial Features

In spatial features, type means a description that suggests characteristics that identify a particular kind of space. Typical identities would be a classroom, a particular shop, a laboratory, an office, a central storage room, a locker room, and a computer center as well as others.

Size refers to area and dimensions. The area of a station represents the gross area in square feet. It does not include distinct and separate spaces such as a storage room. However, the area would include an alcove which is really a definite part of a station. The dimension of a station gives the width, length, and height in feet.

If a station has a separate storage area identified with it, the width and length are requested so the type and dimensions of space are more meaningful.

Construction Features

Construction features represent how parts are assembled and arranged in a structure and out of what materials. Floor treatments include such materials as hardened concrete, terrazzo, ceramic tile, rubber tile, vinyl tile, maple flooring, and carpeting. There are other floor treatments under trade names that provide rubberized-synthetic finishes. Wall treatments of rooms include such things as exposed block, painted plaster, natural brick, vinyl paper, carpeting, mosaic tile, or some combination of wall finishes. There are different movable panels of various finishes used as partitions between areas. Ceilings may be exposed or may be plastered and painted. Then there are a variety of ceiling treatments using different tile and suspension arrangements. Very often the tile has acoustical qualities. The structural system broadly identified is framing and assemblies of several types such as load bearing, skeletal, or shell. The exterior walls range between water-repellent concrete block or clapboard siding to aluminum or pre-cut stone modules. A common exterior wall is brick face with interior block backing. There are a variety of "sandwich" panels and sheathing being used for exterior wall fabrication today that go by a number of trade names. The window area of a station and how far above floor level the windows are located are important in assessing natural lighting features and controls, heat loss

from a station, and flexibility of use of space in a station. Thus, recording the window area in sq. ft. and the height above floor in feet provides objective input to use in judging the visual and thermal components of a facility. Movement into and out of stations for students, vehicles, freight, and equipment requires adequate routes of ingress and egress. The dimensions of overhead doors (e.g., 14' x 14') and other interior-exterior doors provide information for assessment of traffic flow.

Electrical Features

Electric lights and power are important features of facilities. Illumination levels and controls are important to proper seeing and efficiency. Electric power is important to the operation of equipment, machines, and mechanical services. If lighting is incandescent and direct or indirect and if lighting is fluorescent and direct or indirect this is helpful information in assessing visual qualities. Knowing the number of switches by which lighting is controlled and regulated helps ascertain flexibility and efficiency of the illumination system. Finally, if the lighting scheme is task-area lighting arranged with low level brightness levels throughout the area as opposed to area lighting at high brightness levels, it is important, too, in assessing flexibility and efficiency.

Electric power is important to most program operations. For example, convenient outlets in classrooms, labs, and shops facilitate program operations. The number of wall outlets available, the height of these outlets from the floor, and the distance between outlets is usable information. The voltage of the outlets (e.g., 110 v.) also is requested. Machine outlets provide the power needed for operation of much instructional and non-instructional equipment. The number of machine outlets available in a station and whether the service to these outlets is from the ceiling or floor is recorded information needed in assessment. Again voltage to these outlets is requested (e.g., 110 v.,

220 v., variable voltage, 3-phase).

The number of outside outlets that serve a station is requested information on the inspection form. The availability of a master control box is asked for (yes or no) as is the availability of a panic button (yes or no).

Electronic Features

The availability of an intercommunication system should be noted by using the appropriate symbol. Use 1W to indicate one-way intercom and 2W to indicate two-way intercom. A zero (0) indicates no intercom. If telephone service is available in a station or convenient to a station (i.e., hallway by the station) this is to be indicated. Write "yes" or "no" on the appropriate blanks. Do likewise if there is a terminal for TV service in the station. Electronic sensors are of various types (e.g. sprinkler system, smoke sensor, security sensor). Write the type or types on the blank for each station where applicable. Use "none" to indicate the absence of any electronic sensor.

Mechanical Features

The heating, ventilating, and air conditioning features of a station are to be reported under HVAC systems. Energy sources indicate the type of fuel or power. It is to be noted whether it is electric, gas, oil, coal, or some combination. The type heat refers to the design of the mechanical equipment for conveying heat. The common types include forced hot air, steam or hot water, heat pumps, and resistance type electrical heat. The capacity to control the heat is regulated by individually controlled thermostats. Use "yes" to indicate station control and "no" to indicate some other arrangement (e.g., zone or suite). Similarly, indicate by "yes" or "no" the availability or non-availability of air conditioning.

The plumbing service includes the providing of water and the disposal of

water. The blank opposite water service should have one of four symbols: H - C -- hot and cold, H -- hot, C -- cold, and 0 (zero) indicating no water service in a station. Use "yes" or "no" to indicate availability or non-availability of drinking fountains, lavatories, floor drains, hose bibs, and outside water service for a particular station.

The gas service to a particular station is noted by "yes" indicating the service is available and "no" to indicate not available. The type service is noted by indicating bottled gas or natural gas. Put the number of gas outlets available in a station on the blank "No. gas outlets." If there is a master control for gas in the station write "yes," if not, write "no" on the blank.

The compressed air service to a particular station is noted by "yes" indicating availability or "no" indicating non-availability. The number of disconnect outlets in a station is placed on the blank (e.g., 1, 2, 6, etc.). If the air service is available by an outside disconnect outlet, indicate by "yes" and write "no" if the outside service is not available.

Health and Safety Features

Health features include personal care and conveniences and presence of clean and fresh air. Use "yes" for noting availability and "no" for non-availability of restrooms, lockers, drinking fountains, and hand-washing lavatory in or convenient to a station. If a station has the mechanical means available for dust-fume removal and special ventilation beyond normal station services indicate by "yes" and write "no" if these special means are not available.

Safety features indicate the availability and adequacy of design layouts and special equipment to improve safety in a station. Use "yes" if the layout or equipment is adequate or available. Use "no" if there are not fire extinguishers, sprinkler systems, exit markings, and an alarm system available and if clear traffic lanes and security are not adequate.

Barrier Free Features

Instructional stations and equipment should be appropriate so handicapped persons can be accommodated. The presence of special equipment (e.g., lavatory, telephone, drinking fountain, toilet stall) operable by handicapped persons should be noted by "yes" or "no." If the equipment is in working order indicate by "yes" and if not, place a "no" on the blank. If movement into or out of a station is not restrictive for the handicapped indicate this by "yes." This means doors should be sufficiently wide for persons in wheel chairs (at least 32" wide in the clear, operable by these persons, and sufficient room inside and outside the station for wheelchair turn arounds). Adequate H-V (horizontal-vertical) movement for the handicapped also should be noted. Gentle sloping ramps (1' in 12'), non-slip surfaces, firm handrails, curb cuts, and elevators are H-V movement features necessary for handicapped persons. Again, use "yes" or "no" to indicate adequacy or inadequacy, respectively.

Special Equipment Features

If there is a special feature that one wishes to measure or observe, it should be specified and then appropriately recorded on the blank for each station. For example, if one wishes to know if stations have electrostatic air purification units, this would be specified and indicated by marking "yes" or "no."

Other Feature(s)

If there is interest in observing some features of stations, these should be noted under "Other." It may be, for example, that you wish to note whether stations have expansion possibilities. You would specify "expandibility potential" and then indicate "yes" or "no" on the blanks.

SCHOOL SITE ASSESSMENT

The site is an integral part of an educational complex. It, of course, provides the areas and settings for buildings. In addition, it supports many other functions and services. The site may be an extension of classrooms, labs, and shops used for instructional purposes. It also may provide areas allocated for roads, walks, and lots to accommodate pedestrian and vehicular traffic movement and parking. Sites are used as school and community resources for recreation. Finally, a site may provide an open and aesthetic setting. Characteristics and features of site components are summarized to help clarify elements that are evaluated in application of the site assessment instrument.

Acceptability Component

A school site should be viewed favorably as a desirable location for educational facilities. It should "fit" the area. Site neutrality is a factor in judging its acceptability. Neutrality is important in communities comprised of definite neighborhoods. A reasonable level of community agreement about a particular location ought to be apparent. In determining acceptability, the potential for aesthetic satisfaction and visual comfort through natural features and good landscaping are important considerations. Site beautification potential is relevant to obtaining views both from the site and toward the site which are pleasant. The quality of the environment should be acceptable to whatever use the site is to be put.

Accessibility Component

It is important that a school site be located as conveniently as possible for the population to be served--for both pedestrian and vehicular traffic. Traffic should be able to flow efficiently, safely, and in a controlled pattern.

Routes of ingress and egress should provide for regulation of traffic which will avoid bottlenecks, confusion, and interference with on-site and off-site traffic flow. Traffic safety is an important consideration. In addition to being accessible to the various building and site users, the site should be convenient to public services and public utilities.

Suitability Component

Size and shape are important considerations because they give flexibility in site development. Building placements and orientations, outdoor instructional-recreational allocations, and service areas need to be accommodated on the site. Conflicts in use need to be avoided, and the school needs to be protected from unsightly surroundings and disturbing distractions. Suitability is influenced by land characteristics. Contour and layout of the site as related to such factors as drainage, elevation, and erosion do influence the degree of suitability of a site. The subsoil condition is important in regard to providing a good base for building.

Site Development Component

The school site should be adequate so it can appropriately accommodate the various uses to which it will be put. Site planning to arrive at user requirements is important. The site needs performance specifications just as does the school building. Site development that accommodates such features as building placement, grounds beautification, site surfaces, service areas, and site layouts is essential.

SCHOOL BUILDING ASSESSMENT

The system's approach to school facility assessment represents an attempt to evaluate a delivery system which recognizes, correlates, and arranges parts. The system components are those elements which interact in the production of a facility. The spatial, sonic, thermal, visual, hygienic, safety, traffic, equipment, and structural components are the essential factors that, it is hoped, combine to produce a harmoniously constructed facility that performs well. Each of these components is discussed briefly to help clarify the place of the component as it contributes to the complete facility.

Spatial Component

The spatial component includes the type of spaces needed and their association, accessibility, arrangement, and fit within a facility. An educational facility should be designed so that it functions as a single unit. Parts should be located in proper relation to each other so that building activities can be conducted efficiently, conveniently, and safely. Spaces housing similar or closely related instruction activities should be clustered together (i.e., vocational shops, labs, and classrooms). In contrast a machine shop should be separated from the library.

Spaces for learning should be suitable from the stand point of shape, size, atmosphere, and location. Shaping and sizing of instructional spaces should be suited to the functions they are designed to serve (e.g., ratio of 1' of width to 1.5' of length for shops) and the clientele to be accommodated (e.g., the handicapped). A certain degree of futurism and creativity are good prerequisites in planning educational spaces. Flexibility and adaptability of space are becoming watchwords. As educational methods and curricula change, financial factors may prohibit construction of new facilities;

so existing space will have to be adaptable.

Easy access and convenience of movement through a facility also are primary considerations for planning in the spatial dimension. Circulation patterns must allow students and equipment to flow rapidly within and among units in the facility.

Once the function and type of space is known and its association, suitability, size, and shape are identified, then other components which directly relate to the spatial one can be considered.

Sonic Component

The sonic component is concerned with the quality and reduction of sound and the control of noise. Problems of acoustics are affected by both the design and the location of a room. A significant portion of the instructional process depends upon good hearing conditions. Sound quality is a problem which can be solved largely by good acoustical treatment. Speech should be heard distinctly without effort. Sound reduction and sound control are problems that can plague poorly designed vocational facilities. Sound control relates to the problem of air-borne (within classrooms and lecture stations) and structure-borne (from machinery, pipes, ventilation, and water systems) noise. Sound reduction relates to the problem of creating a condition that falls within the noise tolerance levels through the suppression and isolation of noise (transmission loss).

Good hearing conditions depend on adding sufficient sound-absorption materials to obtain the optimum reverberation time as it relates to function. Reverberation time depends on the volume of space and the purpose of the space. Good hearing conditions also depend on retaining some sound reflective properties of the ceiling in order to improve the transmission of sound from one end of the room to the other. Acoustical treatment is generally most effective if placed where large surfaces intersect at angles of less than 180 degrees.

Control of noise interference originating from outside a room can be achieved by selecting a site away from unwanted sounds, suppressing the noise at the source, isolating the noise physically, isolating the noise acoustically, and/or by designing partitions with proper sound transmission loss. Air-borne sound can be contained by nonporous partitions while structure-borne noise may need to be controlled by acoustical discontinuities within the structural design of the facility. Typical noise control problems include disturbances from adjacent activities, mechanical equipment, lighting hum, air registers, outside traffic, leaking partitions, cracks, ductwork, and vibration in the structure and pipes.

Generally acoustics is affected by the use of space, its size and shape, its relationship to other spaces, its location within the institution, and its proximity to noise producing objects on or adjacent to the institution site.

Thermal Component

The thermal environment involves examination of those mechanical aspects of a facility having to do with heating, ventilation, cooling, and humidity equilibrium. It should be designed to provide a comfortable, healthy, and efficient setting for accommodating people using the facility. The thermal system should provide flexibility in regulation and respond to change to achieve adequate climate control. Air temperature demands of spaces vary with use. A classroom where activities tend to be sedentary requires heat ranges from 65° to 70° F. whereas a shop where there is considerable movement may require temperatures of 60° to 65° F. Storage areas and the like may not require heat beyond 55° F. Relative humidity strongly influences comfort (in normal situations a relative humidity of about 60 percent is quite acceptable). Ventilation in facilities is important for comfort and health. Forced ventilation ought permit adequate air exchanges to remove body odors and obnoxious odors generally. Cooling also may be important in certain areas for efficient performance. In other areas it may be an unneeded luxury. Efficient thermal operation must

take into account the problem of depleting energy supplies and rising energy costs.

There are facility features other than the HVAC system that are important to the thermal environment. There are design features and construction materials that influence thermal conditions. The number and location of windows may aid in ventilation and also will be an important consideration in heat loss. The color scheme of a facility exterior and the quality and extent of insulation ought be such as to improve thermal conditions. Zone control of the thermal environment is important too for economy by permitting certain areas to be used independently of other areas.

Visual Component

Conditions that allow adequate visibility to be provided to meet task demands is important in communication and performance. The visual environment involves artificial and natural lighting, brightness differences, reflection characteristics, and visual control. The visual objective is to provide efficient, glare-free light on tasks while maintaining a fairly low level of lighting in areas surrounding the tasks. It does not follow that increasing light intensity (foot-candles) necessarily improves seeing and the quality of light. Quality of light is a product of light intensities and reflection factors of colors. Switches, rheostats, and timers should provide the means for light adjustment and control. Lighting and color requirements vary with location, function, and use of space. Thus, capacity to regulate lighting is important.

In addition to providing quality seeing conditions, coloring and lighting should increase orderliness, reduce maintenance, and improve safety and security. Good coloring complemented by lighting helps create cheerfulness, dignity, and purpose for spaces within a facility. Efficiency of lighting systems is important to energy conservation. Finally, colors and lights can help reduce physical tension, conserve human energy, and increase work efficiency in facilities.

Hygienic Component

Convenient, comfortable, and healthy conditions are products of careful planning. In the broad sense a healthy environment is created when lighting and coloring, HVAC control, noise and sound control, quality of sound, and style and type of equipment are appropriately balanced to create a comfortable setting. And, further, where personal care conveniences such as restrooms, lockers, drinking fountains, and storage shelving and cabinets are adequately available, the healthfulness of the environment is improved. Finally, a healthful environment is one that has plans, space, and equipment for handling, perhaps on a temporary basis, persons who are ill or injured. Restrooms should be attractive, clean, well ventilated, properly equipped (including handicapped), and constructed of impervious materials. Lavatories, whether the open shop or restroom type, should be designed for sanitation and economy. Whether foot-operated, hand-operated, or both, handicapped persons should be able to operate the the lavatory equipment. Delayed-closing spigots will improve economy. Drinking fountains should be readily accessible. Contamination is minimized when mouths do not come in contact with the orifices. Nozzle heights and arrangements should be such that handicapped persons can use the bubblers. Drain systems should flow immediately into sanitary sewer systems. Sewage disposal systems that don't operate well can create serious health hazards. The water source should provide clear water free from nitrogenous or undesirable mineral content and harmful bacteria. Physical facilities that provide conditions which are hygienic for the occupants and users is an important feature of a facility.

Safety Component

Safety consciousness is a must for both instructors and students: maintaining a safety attitude is difficult in unsafe facilities. Efficient material flow between storage through work stations to use improves safety. Panic buttons to kill power in emergencies should be appropriately located in stations. Grounded wiring for both

heavy and light equipment is desirable as are magnetic switches which automatically turn off machines when a break occurs in a circuit. Sprinkler systems and appropriately located fire extinguishers, fire blankets, and emergency showers are good safety features. Combustible and other hazardous materials should be stored in fire proof containers and storage areas that are clearly marked. There should be ample security of these areas. Electronic sensors are excellent warning devices. Explosion-proof switches and fixtures should be used where needed (e.g., finishing rooms). Dust collection systems and special exhaust systems ought be installed in labs and shops where needed. Filtered air is also a requirement in certain instructional stations. Master control switches and valves are safety features that permit maximum instructor control of such things as power sources and gas furnaces. Floors should be of non-skid materials and fire-retardant materials (e.g., curtains for welding) and safety glass (e.g., plexiglas) should be used to minimize accidents and improve safety. Markings that call attention to safety considerations and person, vehicle, and equipment movement improve safety conditions. The aim should be to create an educational setting that is reasonably safe for even the careless person.

Traffic Flow Component

Movement of people, equipment, and vehicles is important because it affects efficiency and safety. Good traffic flow is important to smooth operations. Corridors should be wide enough to accommodate traffic with a minimum of congestion. Width depends on the people load at peak times of movement. Primary corridors that pick up traffic loads should be wider than secondary corridors that handle less traffic. Corridors should be free of obstructions and projections. Doors should not project into the corridors. If corridors, as may be the case in certain shop areas, handle both vehicular and pedestrian traffic, they should be safety marked. Corridors should terminate at an exit or a

stairway that leads to an exit.

Stairways should be at least two lanes in width. (44" between handrails). Firm handrails should be provided (26" to 30" above nosing). Usually 16 risers per run is a maximum number. Stair risers should be about 6.5" with a minimum nosing on the stair treads. Uniformity in risers height is essential. Stair wells should be safety designed particularly for purposes of egress during emergencies. In multi-story buildings where vertical movement of freight, heavy equipment, and handicapped persons is necessary, elevators are desirable.

When ramps are used to change levels as part of the circulation systems, they should be of gentle slope (i.e., ramp's slope of 1' in 12'). Non-slip surfaces are highly important on ramps. It is important too to provide firm handrails where ramps are long.

Door access and clearance are important considerations too. A minimum door clearance should be 32 inches. Important too is whether access to doors is such that persons handling materials or in wheel chairs can conveniently open and pass through a door. Doors should be sized to handle the traffic necessary for program operations and accommodating clientele. If doors open to the outside of a building they should be appropriately marked.

The aim of traffic flow and circulation is to permit independent, rapid, and safe movement of all people and material necessary in operating an activity or program.

Equipment Component

Equipment is usually identified as fixed or movable. Fixed equipment represents the type furnishings, installations, and stationary stock which is considered a permanent part of a facility (e.g., power service, drainage systems, electronic terminals). Movable equipment represents the type furnishings, installations, and unstationary stock that is not considered a permanent part of

the facility (e.g., wood lathe, sewing machine, window drapes). Desirable features for fixed equipment are being summarized for this component.

The electric power systems should provide good flexibility, desirable power capacities, and dependable and controllable sources. Installation of medium high voltage distribution systems with step-down transformers to provide for flexibility in meeting varying electric power requirements usually is a desirable feature. Power panels should be installed to provide sufficient numbers of separate circuits.

The source, quality, and quantity of water and the type disposal systems are important to many instructional operations and janitorial services in facilities. When ample water that is filtered, conditioned and/or treated as needed is available and accessible, water service meets the test of adequacy. Water faucets, valves, and hose-bibbs should be appropriately located and operable if water service is to be efficient. The sewage service which disposes of waste water, chemical wastes, and solid wastes is important. Appropriate and adequate sewage lines, by-pass catch basins, sand traps, and grease traps should dispose of sewage and waste in a sanitary and rapid way.

Compressed air service is essential to vocational programs in several areas (e.g., automotive shops, health careers). A system that provides from 60-150 lbs. pressure per square inch usually is sufficient. The unit should be centrally located so it is reasonably isolated but protected from the elements. Compressed air should be filtered and regulated. An adequate number of disconnect outlets should be conveniently placed. The compressed air service is dependable when the air pressure is available on call with the pressure as needed. There should be access to master valve to control air service.

The variety of gas services required in vocational programs are many. (e.g., gas fired kilns, acetylene and oxygen for welding, gas operated appliances, lab gas outlets, heat treatment, forging). The location, storage, hood ventilation, and master control and regulation are all critical aspects of gas installations.

Unit control valves as well as a master control valve for gas service is important. Gas storage should provide a ventilated space away from heat sources. The service is dependable when it supplies the gas needed at the time needed.

Fixed installations that provide the means of taking advantage for the use of a variety of electronic devices is becoming increasingly important in the design of facilities. Service conduits and terminals for telephones, intercoms, and clocks are important to various stations. Similarly there should be distribution systems installed for AV, TV, computer connections where appropriate. Adequacy is judged on the basis of whether there is access to general and emergency communication and, in addition, to use the various electronic aids that are important for instructional improvement.

Structural Component

The structural component of a facility represents framing systems and assemblies, external envelopes, internal treatments, and type construction materials. Structural support systems should provide durability, rigidity, and shock-proofness to the framing (roof, wall, floor, and foundation support). The product of an adequate support system should be a solid, lasting framework which can withstand heavy winds, slight shifting, minor explosions, and fire without premature collapsing and deterioration. The external envelope should provide at least four conditions to be adequate. It should, of course, provide a distinctive and pleasing appearance. But also it should have adequate fire ratings, good insulating qualities, and low maintenance requirements. Similarly, internal treatment of floor, walls, and ceilings should meet adequate technical requirements and functional qualities. Technically, internal treatments should be solid with limited vibration, highly incombustible, soil and damage retardant, wear resistant, and air-tight. Functionally internal treatments should possess good acoustical qualities, minimize sound transmission, improve lighting, provide partition flexibility, fit need (i.e., floor finishes),

and exhibit aesthetic qualities. Construction materials ought provide ease of maintenance and repairability and durability of external and internal features. The structural design and construction materials should provide adequate load bearing capacities, allowances for contraction-expansion, appropriate insulating qualities, adequate wear and weather proofness, good fire ratings, and simple change and repair capabilities. The design intent is to provide a structurally sound facility that presents a pleasing view.

PROCEDURES TO FOLLOW

Once persons or groups have developed adequate familiarity with standards, regulations, guidelines, and programs in vocational education, they are prepared to administer the School Building/Site Assessment Packet to a facility or to use the packet in planning specifications for a vocational facility.

General Data and Inspection Form

The first activity in the assessment is to record the information requested on the first page of the packet. This sheet provides identification and general information data. It is important to be accurate as possible in gathering the identity, building, site, and cost data. These data are relevant as bench mark information in planning. Be certain to explain wherever clarification is needed (e.g., gross square feet of a facility, cost values). No ratings are requested on the first sheet. The information is simply a record of what is at a particular time.

The Inspection Form by-and-large calls for data that can be quantified and measured or clearly observed. Thus, no ratings are included on this form. Most important is correct identification and accurate recording. You may use several or more sets of inspection forms per facility. There are only five stations that can be checked per form. Thus, if assessments are to be made of several programs that have multiple stations in a suite (e.g., Vocational Home Economics, Health Careers, Vocational Agriculture), it will be necessary to use a number of inspection forms.

Site Assessment and Building Assessment Ratings

The site assessment calls for rating of 41 items on a four point scale. Items 1-28 assess four site features (acceptability, accessibility, suitability, and development). Items 28-41 provide a recapitulation of site assessment which

culminates in an over-all rating of site features (item 40) and site improvement (item 41). The building assessment calls for rating 69 items on a four point scale. Items 42 - 90 assess nine building components (spatial, sonic, thermal, visual, hygienic, safety, traffic-flow, equipment, and structural). Items 91 - 110 provide a recapitulation of building assessment which culminates in an over-all rating of construction features (item 109) and education features (item 110).

For the items 1 - 27 and 42 - 90 that are to be rated, are several sub-items under each item. These sub-items provide ratings on specific details that will help one derive the rating for a particular item. For the recapitulation items 28 - 41 and 91 - 110 there are sub-items calling for ratings that collectively assess the site and building.

The scale for the site and building ratings uses four choices (1, 2, 3, and 4):

- 1 - Good. This rating means better than adequate. The condition or status of a thing more than meets normal expectations.
- 2 - Average. This rating meets the test of adequacy. The condition or status of a thing meets normal expectations.
- 3 - Poor. This rating does not meet the test of adequacy. The condition or status of a thing falls below what would be a normal expectation.
- 4 - Can't judge or doesn't apply. This rating indicates either that there is no way to assess an item or that the item to be assessed is not applicable.

The scale for the site and building recapitulation assessment uses a five item rating scale (HS = 1; S+ = 2; S = 3; S- = 4; and US = 5):

- 1 - HS (highly satisfactory). This rating indicates excellence. The feature is outstanding.
- 2 - S+ (satisfactory plus). This rating indicates a feature is good. The feature is more than adequate.
- 3 - S (satisfactory). This rating indicates a feature is average. The feature is adequate.
- 4 - S- (satisfactory minus). This rating indicates a feature is somewhat below average. The feature is somewhat inadequate.
- 5 - US (unsatisfactory). This rating indicates a feature is well below average or very sub-standard. The feature is highly inadequate.

SCHOOL BUILDING/SITE ASSESSMENT PACKET

EXHIBIT _____

School Institution: _____

Building/Site: _____

Location: _____

Bldg./Site Use: _____

Student Levels: _____

Total No. Students: _____

ID Code: _____
Institution Bldg./Site No. County Region _____GENERAL DATABUILDING INFORMATION

Building Area (sq. ft.) _____

Explain: _____

Construction: Date Purpose

Original _____

Addition(s) _____

Type Facility (check one)

Area Vocational School _____

Comprehensive High School _____

Other (specify) _____

Number of Floors

Below Ground _____

Above Ground _____

Total Number _____

SITE INFORMATION

Site size (acres) _____

Shape of site: square _____;

rectangular _____; irregular _____

Acres contiguous: Yes _____; No _____

Site Status (check one)

Being considered _____

Owned (being used) _____

Owned (not being used) _____

No. Bldgs. on Site _____

COST INFORMATION

Site value _____ Act _____; Est _____

Bldg. value _____ Act _____; Est _____

Explain _____

COMMENTS:

by: _____

date: _____

INSPECTION FORM

EXHIBIT _____

Program Area _____

Institution _____

Identification

Station Number

Number Student Stations

Spatial Features

Type (Clrm, Lab, Shop)

Size (area)

Width

Length

Height

Storage (w x l)

Construction FeaturesTreatments (interior)

Floor

Wall

Ceiling

Structural System

Framing

Wall

Doors

Overhead (w x h)

Exterior (w x h)

Interior (w x h)

Windows

Window area

Height off floor

Electrical FeaturesLighting

Type fixtures

Number switches

Light scheme

Power

Wall outlets

No. outlets

Height/space

Voltage(s)

Machine outlets

No. outlets

Service (clng./flr.)

Voltage(s)

No. outside outlets

Master control

Panic button

Electronic Features

Intercom (lw, 2w, o)

Telephone service

TV service

Electronic sensors

Mechanical Features

HVAC systems

Energy source(s)
Type heat system
Station regulation of HV ...
Air conditioned

Plumbing service

Water service
Drinking fountain
Lavatory
Floor drain(s)
Hose bibs
Outside water service

Gas Service

Availability
Type service
No. gas outlets
Master control

Compressed air service

Availability
No. disconnect outlets
Outside air service

Health and Safety Features

Health

Convenient restrooms
Lockers available
Convenient drinking fountain
Convenient hand washing
Dust-fume removal
Special ventilation

Safety

Fire ext. available
Sprinkler system
Exit markings
Alarm system
Clear traffic lanes
*Good security

Barrier Free Features

Special equipment
Equipment operability
Adequate entrances-exits
Adequate H-V movement

Special Equipment Features

Specify
Specify
Specify

Other Feature(s)

Specify
.....

by: _____

date: _____

ACCEPTABILITY

- | | | | | | | | | | | |
|---|---|---|---|-------|----|---|---|---|-------|--------------------------------|
| 1 | 2 | 3 | 4 | ..... | 1. | <u>Compatability with others in area</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Business/industry compatibilit |
| | | | | | 1 | 2 | 3 | 4 | ..... | Residential compatibility |
| | | | | | 1 | 2 | 3 | 4 | ..... | Services compatibility |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 2. | <u>Conditions of site surroundings</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Risk free/safe place |
| | | | | | 1 | 2 | 3 | 4 | ..... | Security provisions |
| | | | | | 1 | 2 | 3 | 4 | ..... | Zoning law protection |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 3. | <u>Traffic flow tolerability</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Traffic disruption tolerabilit |
| | | | | | 1 | 2 | 3 | 4 | ..... | Traffic noise tolerability |
| | | | | | 1 | 2 | 3 | 4 | ..... | Traffic congestion tolerabilit |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 4. | <u>Hazard freeness of surrounding areas</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Pedestrian traffic routes |
| | | | | | 1 | 2 | 3 | 4 | ..... | Traffic crossing controls |
| | | | | | 1 | 2 | 3 | 4 | ..... | Route safety to area |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 5. | <u>Sub-group identity with area</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Age groups |
| | | | | | 1 | 2 | 3 | 4 | ..... | Socio-economic groups |
| | | | | | 1 | 2 | 3 | 4 | ..... | Racial groups |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 6. | <u>Neighborhood desirability</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Commercial-industrial fit |
| | | | | | 1 | 2 | 3 | 4 | ..... | Rural-farm area fit |
| | | | | | 1 | 2 | 3 | 4 | ..... | Residential area fit |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 7. | <u>Environmental Quality of Area</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Dust-dirt freeness |
| | | | | | 1 | 2 | 3 | 4 | ..... | Fume-odor freeness |
| | | | | | 1 | 2 | 3 | 4 | ..... | Noise tolerability |

ACCESSIBILITY

- | | | | | | | | | | | |
|---|---|---|---|-------|-----|--|---|---|-------|--------------------------------|
| 1 | 2 | 3 | 4 | ..... | 8. | <u>Convenience to public services</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Fire services |
| | | | | | 1 | 2 | 3 | 4 | ..... | Police services |
| | | | | | 1 | 2 | 3 | 4 | ..... | Transportation services |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 9. | <u>Convenience to public utilities</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Electricity |
| | | | | | 1 | 2 | 3 | 4 | ..... | Gas |
| | | | | | 1 | 2 | 3 | 4 | ..... | Water and sewer |
| | | | | | | | | | | |
| 1 | 2 | 3 | 4 | ..... | 10. | <u>Barrier freeness of site approaches for handicapped</u> | | | | |
| | | | | | 1 | 2 | 3 | 4 | ..... | Common level-gentle slope walk |
| | | | | | 1 | 2 | 3 | 4 | ..... | Clear vision traffic lanes |
| | | | | | 1 | 2 | 3 | 4 | ..... | Non-slip surfaces |

- 1 2 3 4 11. Convenience to users of facility
 1 2 3 4 Persons who walk
 1 2 3 4 Persons who are transported public
 1 2 3 4 Persons who commute privately
- 1 2 3 4 12. Approach to the site
 1 2 3 4 Roads to site
 1 2 3 4 Walks to site
 1 2 3 4 Bike lanes to site
- 1 2 3 4 13. Site entry-exit efficiency
 1 2 3 4 Entry-exit convenience
 1 2 3 4 Entry-exit controls
 1 2 3 4 Entry-exit safety

SUITABILITY

- 1 2 3 4 14. Desirability of site contour
 1 2 3 4 Elevation
 1 2 3 4 Surface drainage
 1 2 3 4 Erosion controllability
- 1 2 3 4 15. Adequacy of soil structure
 1 2 3 4 Porous sub-soil
 1 2 3 4 Soil base
 1 2 3 4 Ease of surface adaptation
- 1 2 3 4 16. Potential for site adaptation and preparation
 1 2 3 4 w/o extensive fill and cutting
 1 2 3 4 w/o extensive drain pits and shoring
 1 2 3 4 w/o extensive retaining walls
- 1 2 3 4 17. Impact of site to area
 1 2 3 4 Site aesthetics
 1 2 3 4 Seclusion of unsightly places
 1 2 3 4 Potential for landscaping
- 1 2 3 4 18. Dimension-layout acceptability
 1 2 3 4 Size in acres
 1 2 3 4 Shape of width to length
 1 2 3 4 Space utilization potential

DEVELOPMENT

- 1 2 3 4 19. Building placement(s) on site
 1 2 3 4 Building orientation(s)
 1 2 3 4 Buildings placed back from street
 1 2 3 4 Feasibility for site arrangements
- 1 2 3 4 20. Status of landscaping
 1 2 3 4 Building-site appearance
 1 2 3 4 Plantings-vegetation condition
 1 2 3 4 Grounds care condition

RATING SCALE

1 - Good
 3 - Poor

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2 - Average
 4 - Cannot judge or doesn't apply

- 1 2 3 4 21. Site surfaces planning
 1 2 3 4 All-weather surfacing
 1 2 3 4 Turf areas
 1 2 3 4 Apparatus areas
- 1 2 3 4 22. Vehicular traffic drives
 1 2 3 4 Double lane drives with turn around
 1 2 3 4 Clear vision w/o circling buildings
 1 2 3 4 Building service drives
- 1 2 3 4 23. Status of parking areas
 1 2 3 4 Lot(s)-spaces available
 1 2 3 4 Accessibility to building entrances
 1 2 3 4 Space width adequacy (handicapped)
- 1 2 3 4 24. Pedestrian traffic walks
 1 2 3 4 Width of walks
 1 2 3 4 Common level on gentle ramps of walks
 1 2 3 4 Non-slip surfaces & railings if needed
- 1 2 3 4 25. Vehicle disembarking and facility entry ramps
 1 2 3 4 On-site bus stops
 1 2 3 4 Level platforms/unloading docks
 1 2 3 4 Disembarking/unloading convenience
- 1 2 3 4 26. Site safety-security
 1 2 3 4 Lighting adequacy
 1 2 3 4 Traffic controls and markings
 1 2 3 4 Suitable fences and storage
- 1 2 3 4 27. Site layout and allocations
 1 2 3 4 Instructional area allocations
 1 2 3 4 Play-court-athletic allocations
 1 2 3 4 Use of areas w/o conflict

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

Recapitulation of Site Assessment

<u>COMPONENTS</u>		<u>RATING SCALE</u>				
		HS	S+	S	S-	US
<u>Acceptability</u>	28- Location for a school site	1	2	3	4	5
	29- Health, safety, and security	1	2	3	4	5
	30- Compatibility with area	1	2	3	4	5
<u>Accessibility</u>	31- Convenience to users	1	2	3	4	5
	32- Convenience to services & utilities	1	2	3	4	5
	33- Traffic patterns and flow	1	2	3	4	5
<u>Suitability</u>	34- Site size and shape	1	2	3	4	5
	35- Terrain and topography	1	2	3	4	5
	36- Distinctive planning possibilities	1	2	3	4	5
<u>Development</u>	37- Site surfaces and landscaping	1	2	3	4	5
	38- Drives, walks, and parking	1	2	3	4	5
	39- Layout and allocations	1	2	3	4	5
<u>Specifications</u>	40- <u>Site features overall adequacy</u>	1	2	3	4	5
	41- <u>Site improvement overall adequacy</u>	1	2	3	4	5

RATING SCALE

HS - Highly Satisfactory (1)
 S+ - Satisfactory plus (2)
 S - Satisfactory (3)
 S- - Satisfactory minus (4)
 US - Unsatisfactory (5)

EXHIBIT _____

SPATIAL COMPONENT

- 1 2 3 4 42. Availability of appropriate unit areas
 1 2 3 4 Association among units
 1 2 3 4 Design of spaces for special use
 1 2 3 4 Adaptability/modifiability of spaces
- 1 2 3 4 43. Adequacy of unit sizes
 1 2 3 4 Size to shape of spaces
 1 2 3 4 Unobstructed heights of spaces
 1 2 3 4 Instructional to non-instructional areas
- 1 2 3 4 44. Accessibility to related areas
 1 2 3 4 Convenience to personal care areas
 1 2 3 4 Convenience to instructional centers
 1 2 3 4 Convenience to service areas
- 1 2 3 4 45. Movement and natural fit of spaces
 1 2 3 4 Movement within areas
 1 2 3 4 Movement of equipment and materials
 1 2 3 4 Indoor-outdoor arrangements

SONIC COMPONENT

- 1 2 3 4 46. Adequacy of sound-conditioning features
 1 2 3 4 Building envelope treatments
 1 2 3 4 Special acoustical treatments
 1 2 3 4 Unwanted sound restrictions
- 1 2 3 4 47. Quality of hearing environment
 1 2 3 4 Wanted sounds clearly heard
 1 2 3 4 Tolerability levels of sound transmission
 1 2 3 4 Adequacy of sound cushioning and muffling
- 1 2 3 4 48. Adequacy of sound control
 1 2 3 4 Isolation of noise producing activities
 1 2 3 4 Air borne noise tolerability
 1 2 3 4 Structure borne noise tolerability

THERMAL COMPONENT

- 1 2 3 4 49. Thermal adequacy based on need
 1 2 3 4 Heat sufficiency
 1 2 3 4 Ventilation sufficiency
 1 2 3 4 Cooling sufficiency
- 1 2 3 4 50. Regulation for climate control
 1 2 3 4 Ability to change to heat demand
 1 2 3 4 System zoning for partial use
 1 2 3 4 Response of system to outside conditions

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 1 2 3 4 51. Structural-thermal efficiency
 1 2 3 4 Design support for thermal efficiency
 1 2 3 4 Equipment support for thermal efficiency
 1 2 3 4 Low conductance and high resistance

VISUAL COMPONENT

- 1 2 3 4 52. Adequacy of illumination for visual comfort
 1 2 3 4 Brightness level
 1 2 3 4 Ceiling-wall-floor reflection values
 1 2 3 4 Task control of illumination
 1 2 3 4 53. Adjustment-regulation for visual control
 1 2 3 4 Availability of multiple control switches
 1 2 3 4 Provision of rheostats where needed
 1 2 3 4 Regulation of natural light
 1 2 3 4 54. Flexible and economical light system
 1 2 3 4 Low brightness of large areas by luminaires
 1 2 3 4 Lighting responsiveness to space changes
 1 2 3 4 Energy efficiency of illumination

HYGIENIC COMPONENT

- 1 2 3 4 55. Personal care and conveniences for facility users
 1 2 3 4 Restrooms conveniently accessible
 1 2 3 4 Restroom availability for both sexes
 1 2 3 4 Restroom provisions for handicapped
 1 2 3 4 56. Design of lavatory-toilet facilities
 1 2 3 4 Clean and sanitary (w/o odor)
 1 2 3 4 Use of impervious materials
 1 2 3 4 Entrance-exit shielding
 1 2 3 4 57. Availability of special hand washing facilities
 1 2 3 4 Number of open hand washing facilities
 1 2 3 4 Placement of open lavatories
 1 2 3 4 Operable by handicapped
 1 2 3 4 58. Availability of lockers and shelves
 1 2 3 4 Space for personal item storage
 1 2 3 4 Lockers for special clothing storage
 1 2 3 4 Location/ventilation of lockers

SAFETY COMPONENTS

- 1 2 3 4 59. Precautions for hazards from fumes
 1 2 3 4 Noxious materials storage
 1 2 3 4 Hood and shield protection devices
 1 2 3 4 Devices to handle dangerous materials
 1 2 3 4 60. Special hazard minimizing equipment
 1 2 3 4 Explosion proof electrical fixtures
 1 2 3 4 Special exhaust fans
 1 2 3 4 Electronic sensors

RATING SCALE

1 - Good
 3 - Poor

96
 44

2 - Average
 4 - Cannot judge or doesn't apply

- 2 3 4 61. Safe movement of people in facility
 1 2 3 4 Clear traffic lanes (w/o projections)
 1 2 3 4 Traffic lanes lead to foyers and exits
 1 2 3 4 V-H traffic flow for handicapped
- 2 3 4 62. Adequacy of fire safety conditions
 1 2 3 4 Controls for combustible gases
 1 2 3 4 Adequacy of number/types of circuits
 1 2 3 4 Storage-disposal of combustibles
- 2 3 4 63. Physical shape of facility for safety
 1 2 3 4 Structural soundness for safety
 1 2 3 4 Secure-shock proof connections
 1 2 3 4 Working condition of operable parts
- 2 3 4 64. Adequacy of safety control equipment
 1 2 3 4 Emergency and fire doors
 1 2 3 4 Location and marking of extinguishers
 1 2 3 4 Adequacy of emergency lighting

TRAFFIC FLOW COMPONENT

- 2 3 4 65. Efficiency of traffic flow in corridors
 1 2 3 4 Traffic handling w/o congestion
 1 2 3 4 Corridors clearly distinguishable
 1 2 3 4 Corridor size for traffic load
- 2 3 4 66. Personnel-equipment movement in corridors
 1 2 3 4 Clear of obstructions and projections
 1 2 3 4 Non-slip treatment of floors
 1 2 3 4 Accommodate movement of handicapped
- 2 3 4 67. Personnel-equipment movement to different levels
 1 2 3 4 Handling 2-way traffic on stairs
 1 2 3 4 Ramps have gentle slope
 1 2 3 4 Elevators for equipment and handicapped
- 2 3 4 68. Adequacy of stair-well features
 1 2 3 4 Availability of firm handrails
 1 2 3 4 Non-skid surfaces of stairs
 1 2 3 4 Nosing-height features of stairs
- 2 3 4 69. Design of vertical movement features
 1 2 3 4 Location of stairs to exits
 1 2 3 4 Intermittent platforms for stairs
 1 2 3 4 Control-safety design of stair wells
- 2 3 4 70. Efficiency of ingress-egress from facility
 1 2 3 4 Exit unit width of doors
 1 2 3 4 Ease of opening doors
 1 2 3 4 Door closure operation
- 2 3 4 71. Adequacy of door features
 1 2 3 4 One-level exit platforms
 1 2 3 4 Operation of anti-panic hardware
 1 2 3 4 Day-night markings of exits

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 2 3 4 72. Efficiency of internal traffic movement
 1 2 3 4 Traffic changes and dispersals
 1 2 3 4 Movement within suites and among areas
 1 2 3 4 Movement of equipment and freight
- 2 3 4 73. Efficiency of external traffic movement
 1 2 3 4 Location of exits for traffic flow
 1 2 3 4 Crowd movement out of facility
 1 2 3 4 Dispersals from parking areas

EQUIPMENT COMPONENT

- 2 3 4 74. Adequacy of electrical service for task demands
 1 2 3 4 Meeting power requirements
 1 2 3 4 Accessibility of power source to equipment
 1 2 3 4 Dependability/controllability of power
- 2 3 4 75. Adequacy of gas service for task demands
 1 2 3 4 Meeting gas requirements
 1 2 3 4 Accessibility of gas outlets
 1 2 3 4 Dependability/controllability of gas service
- 2 3 4 76. Adequacy of compressed air for task demands
 1 2 3 4 Meeting air requirements
 1 2 3 4 Accessibility of dis-connect outlets
 1 2 3 4 Dependability/controllability of air service
- 2 3 4 77. Adequacy of water service to meet task demands
 1 2 3 4 Meeting quality-quantity requirements
 1 2 3 4 Availability of service equipment
 1 2 3 4 Dependability/controllability of water service
- 2 3 4 78. Adequacy of electronic installations for task demands
 1 2 3 4 Conduit for communication terminals
 1 2 3 4 AV/TV/computer connections/distributions
 1 2 3 4 Terminals for clocks/intercoms/telephones
- 2 3 4 79. Adequacy of special equipment needs
 1 2 3 4 Special exhaust systems
 1 2 3 4 Filtered-humidity controlled air
 1 2 3 4 Special drainage systems

STRUCTURAL COMPONENT

- 2 3 4 80. Adequacy/durability of structural support system
 1 2 3 4 Weight support/load bearing capacity
 1 2 3 4 Minimal contraction-expansion problems
 1 2 3 4 Spanning provides partition flexibility
- 2 3 4 81. Adequacy of external wall treatments
 1 2 3 4 Rigid, safe, and wear resistant
 1 2 3 4 Control of thermal conductance
 1 2 3 4 Efficiency for maintenance

Rating Scale

1 - Good
 3 - Poor

98

2 - Average
 4 - Cannot judge or doesn't apply

- 2 3 4 82. Adequacy of internal wall technical qualities
1 2 3 4 Partitions tight w/o vibrations
1 2 3 4 Tolerability of noise transfer
1 2 3 4 Facing and fire-rating quality
- 2 3 4 83. Adequacy of interior wall functional qualities
1 2 3 4 Reflections complement lighting
1 2 3 4 Acoustical properties
1 2 3 4 Aesthetics of finishes
- 2 3 4 84. Adequacy of ceiling technical qualities
1 2 3 4 Strength of suspension w/o air leakage
1 2 3 4 Shape support of acoustics
1 2 3 4 Ease of repair and maintenance
- 2 3 4 85. Adequacy of ceiling functional qualities
1 2 3 4 Reflective quality supports lighting
1 2 3 4 Absorbent quality supports hearing
1 2 3 4 Aesthetic quality
- 2 3 4 86. Adequacy of technical floor treatments
1 2 3 4 Treatment varies by use
1 2 3 4 Wear qualities
1 2 3 4 Appropriateness of resiliency
- 2 3 4 87. Adequacy of functional floor treatments
1 2 3 4 Appearance
1 2 3 4 Acoustical quality
1 2 3 4 Reflective features
- 2 3 4 88. Adequacy of roof and roof deck
1 2 3 4 Waterproofness of roofing system
1 2 3 4 Handling of roof load
1 2 3 4 Span, fire-rating, insulating qualities
- 2 3 4 89. Adequacy of foundation support system
1 2 3 4 Durability
1 2 3 4 Waterproofness
1 2 3 4 Appropriateness of insulation
- 2 3 4 90. Adequacy of structural envelope
1 2 3 4 Fire, wear, weather, and sound properties
1 2 3 4 Design, shape, appearance, and materials
1 2 3 4 Appropriateness of doors and windows

RATING SCALE

1 - Good
3 - Poor

2 - Average
4 - Cannot judge or doesn't apply

Recapitulation of Building AssessmentCOMPONENTSRATING SCALE

		HS	S+	S	S-	US
<u>Spatial</u>	91- Unit stations and layout	1	2	3	4	5
	92- Unit sizes (l x w x h)	1	2	3	4	5
<u>Sonic</u>	93- Quality of sound	1	2	3	4	5
	94- Noise control	1	2	3	4	5
<u>Thermal</u>	95- Climate control (HVAC)	1	2	3	4	5
	96- Energy sources and efficiency	1	2	3	4	5
<u>Visual</u>	97- Lighting adequacy/controllability	1	2	3	4	5
	98- Visual flexibility/efficiency	1	2	3	4	5
<u>Hygienic</u>	99- Personal care convenience	1	2	3	4	5
	100- Design features support for health	1	2	3	4	5
<u>Safety</u>	101- Hazard controls (fumes, fire, explosion) ...	1	2	3	4	5
	102- Structural-equipment conditions for safety ..	1	2	3	4	5
<u>Traffic-flow</u>	103- Internal movement (H/V people/equipment) ...	1	2	3	4	5
	104- External movement (people/vehicular)	1	2	3	4	5
<u>Equipment</u>	105- Public Utilities and Services	1	2	3	4	5
	106- Special equipment installations	1	2	3	4	5
<u>Structural</u>	107- Durability of structural envelope	1	2	3	4	5
	108- Design treatments	1	2	3	4	5
<u>Specifications</u>	109- Construction features overall adequacy	1	2	3	4	5
	110- Education features overall adequacy	1	2	3	4	5

RATING SCALE

HS - Highly Satisfactory (1)
 S+ - Satisfactory plus (2)
 S - Satisfactory (3)
 S- - Satisfactory minus (4)
 US - Unsatisfactory (5)

Exhibit IV-2. Applicability/Validity Checks and Instrument Review Comments.

THE WILLIAMSPORT AREA COMMUNITY COLLEGE

1005 West Third Street, Williamsport, Pennsylvania 17701, 717-326-3761

Williamsport Campus and
Administrative Offices
located in Williamsport
717-326-3761

Office of the President

Earth Science Campus
located in
Millenwood-Montgomery Area
717-547-1661

May 24, 1978

Aviation Center
located at
Williamsport Lye...
County Airport
in Montoursville
717-326-3761

Dr. Norbert J. Nelson, Professor
Education and Administration
F15 S. Campus Court
Purdue University
West Lafayette, IN 46907

Sponsor School Districts:
Canton

Dear Norb:

East Lycoming
Jersey Shore
Keystone Central
Line Mountain
Midd West
Mifflinburg
Millville
Montgomery
Montoursville
Northern Potter
Northern Tioga
Schuylkill
South Williamsport
Southern Tioga
Sullivan County
Troy
Warrior Run
Wellington
Williamsport

Attached is the questionnaire and information you left with me. I do hope you will find everything in order. I am also attaching a copy of our Earth Science Facility plans for your information.

In regard to the classroom/shop area for our Forestry program, it is a bit different from the regular ~~Forestry~~ Vocational programs. As you will note, there is no Forestry shop as such. Students use the standard classroom, the sawmill, and as I mentioned on the inspection sheet, the outdoor forest area, which I judge is in the neighborhood of 1,000 acres of forest land for the students to get their forestry experience.

The sawmill, which is our most recent building at the Earth Science campus, is a typical wood airy building that you would find in any commercial sawmill industry.

In addition to the classroom, sawmill, and outdoors, the students have access to the vo-ag shop for both their instructional and special needs.

The Schneebeli Building cost 1.2 million dollars, according to the figures I checked, at the time of construction. This does not include the inflationary values nor the improvements since its construction. In addition to this, we have added two greenhouses and the sawmill, which I would judge to cost an estimated \$40,000 each. In some cases these buildings, particularly the sawmill, were constructed by the Building Trades students and the staff.

Dr. Norbert J. Nelson
May 24, 1978
Page 2

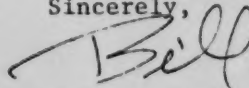
In regard to the site (land) value, we did receive 169 acres from the federal government and I estimate that the land would be worth approximately \$1,000 per acre. The cost of the site preparation during the early stages of the Schneebeli Building was approximately \$20,000.

I had the high school instructors for each program go with me to complete each inspection form.

I hope you will find this information in order and if you need any other information please feel free to let me know. I do hope you had a good trip to New York.

Give our regards to Marguerite. Good luck in your studies.

Sincerely,



William Homisak
Assistant to the President

WH/m
Attachment

INSPECTION FORM

EXHIBIT 2Program Area H.S. Forestry
Institution Williamsport Area Community CollegeIdentificationStation Number
Number Student Stations 1027Spatial FeaturesType (Clrm, Lab, Shop)
Size (area)
Width
Length
Height
Storage (w x l) / office Saw Mill
2400
30'
80'
8'
8' x 13'Clrm.
680
20'
30'
10'
10 x 26' (shred)Outside
Forest Area
(available acreage of
approx 1000 A.)Construction FeaturesTreatments (interior)
Floor
Wall
Ceiling Wood
Wood
Corrugated / AsphaltTile
Block
AcousticalStructural SystemFraming
Wall Wood
WoodSteel
BlockDoorsOverhead (w x h)
Exterior (w x h) (1) 5' x 5' (2)
Interior (w x h) 20' x 8'
32' x 7'
00
0
3' x 7'WindowsWindow area
Height off floor 72
App. 20"120
32"Electrical FeaturesLightingType fixtures
Number switches
Light scheme Floor / Susp.
1
SuspendedFloor / Susp.
1
SetPowerWall outlets
No. outlets
Height / space
Voltage(s)
Machine outlets
No. outlets
Service (cng. / flr.)
Voltage(s)
No. outside outlets
Master control
Panic button 4
4' / 20'
110
3
6' / 9'
220
0
YES
43
18" / 15'
180
0
0
0
0
0Electronic FeaturesIntercom (1w, 2w, o)
Telephone service
TV service
Electronic sensors 0
0
0
12/w
YES
0
0Note: Forestry students have Access to use the Voc. Ag. Shop. described in Exhibit E.

Mechanical FeaturesHVAC systems

Energy source(s)	<u>Electric</u>	<u>Electric</u>			
Type heat system	<u>0</u>	<u>Electric</u>			
Station regulation of HVAC ...	<u>0</u>	<u>yes</u>			
Air conditioned	<u>0</u>	<u>No</u>			

Plumbing service

Water service	<u>0</u>	<u>No</u>			
Drinking fountain	<u>0</u>	<u>No</u>			
Lavatory	<u>0</u>	<u>No</u>			
Floor drain(s)	<u>0</u>	<u>No</u>			
Hose bibs	<u>0</u>	<u>No</u>			
Outside water service	<u>0</u>	<u>No</u>			

Gas Service

Availability	<u>0</u>	<u>No</u>			
Type service	<u>0</u>	<u>No</u>			
No. gas outlets	<u>0</u>	<u>0</u>			
Master control	<u>0</u>	<u>0</u>			

Compressed air service

Availability	<u>0</u>	<u>No</u>			
No. disconnect outlets	<u>0</u>	<u>0</u>			
Outside air service	<u>0</u>	<u>0</u>			

Health and Safety FeaturesHealth

Convenient restrooms	<u>No</u>	<u>yes</u>			
Lockers available	<u>yes</u>	<u>yes</u>			
Convenient drinking fountain	<u>No</u>	<u>yes</u>			
Convenient hand washing	<u>No</u>	<u>yes</u>			
Dust-fume removal	<u>yes</u>	<u>No</u>			
Special ventilation	<u>No</u>	<u>yes</u>			

Safety

Fire ext. available	<u>yes</u>	<u>No</u>			
Sprinkler system	<u>No</u>	<u>No</u>			
Exit markings	<u>No</u>	<u>No</u>			
Alarm system	<u>No</u>	<u>yes</u>			
Clear traffic lanes	<u>yes</u>	<u>yes</u>			
Good security	<u>No</u>	<u>yes</u>			

Barrier Free Features

Special equipment	<u>yes</u>	<u>0</u>			
Equipment operability	<u>yes</u>	<u>0</u>			
Adequate entrances-exits	<u>yes</u>	<u>yes</u>			
Adequate H-V movement	<u>yes</u>	<u>yes</u>			

Special Equipment Features

Specify <u>2/w Radio System</u> ...	<u>✓</u>				
Specify <u>Specific Designed Eq. for Prog.</u> ...	<u>✓</u>				
Specify <u>SKY lights in Roof</u> ...	<u>✓</u>				

Other Feature(s)

Specify <u>Area Log Storage</u> ...	<u>✓</u>				
<u>Area Wood Dry-Storage</u> ...	<u>✓</u>				

* Note: Sawmill is ~~Out~~ Open Space
Wood Frame Bldg. Designed as a Typical
Commercial Mill. Located several hundred
Feet From the Main Bldg.

by:

W. Hornselt

date:

5-23-78

EXHIBIT _____

School Institution: Williamsport Area Community College
 Building/Site: Herment. Schneebeli Bldg./Earth Science
 Location: R.D. #1 Montgomery, Pa. (10 Mi. S. Main Campus.

Bldg./Site Use: All Earth Science Programs

Student Levels: H.S. & College

Total No. Students: Approx 450

ID Code: _____
 Institution _____ Bldg./Site No. _____ County _____ Region _____

GENERAL DATA

BUILDING INFORMATION

Building Area (sq. ft.) 40,164

Explain: Does NOT include 2 Greenhouses & Sawmill

Construction:	Date	Purpose
Original	<u>Jan. 71</u>	<u>Instruction</u>
Addition(s)	<u>1974</u>	<u>Greenhouses - "</u>
	<u>1976</u>	<u>" " - "</u>
	<u>1977</u>	<u>Sawmill - "</u>

Type Facility (check one)

Area Vocational School ☐

Comprehensive High School ☐

Community College w/H.S. Arts ☒

Other (specify) ☒

Number of Floors

Below Ground ☐

Above Ground 1 ☒

Total Number 1

SITE INFORMATION

Site size (acres) 169

Shape of site: square _____;
 rectangular _____; irregular ☒

Acres contiguous: Yes ☒; No ☐

Site Status (check one)

Being considered ☐

Owned (being used) ☒

Owned (not being used) ☐

No. Bldgs. on Site 4

COST INFORMATION

* Site value _____ Act _____; Est _____

Bldg. value 1,200,000 Act ☒; Est _____

Explain Cost of Construction 1971. Does NOT

include the other 3 Bldgs - avg. Est. Cost of \$40,000 Each.

by: W. Hornsack

date: 5-23-78

COMMENTS: The Land was Acquired at No Cost to The College through the Federal Government. At Time of Construction Approx. \$25,000 was spent in Site Preparation all other work was done as instructional Projects. Would Estimate Val. of Land at \$1,000 pr. A.

INSPECTION FORM

EXHIBIT 1

Program Area

High School

Vocational Agriculture

Institution

Williamsport Area Community College

Identification

Station Number

Number Student Stations

2025

Spatial Features

Type (Clrm, Lab, Shop)

ShopClassroom

Size (area)

25184580

Width

39'20'

Length

70'30'

Height

12'10'

Storage (w x l)

10x1010x7

Construction Features

Treatments (interior)

Floor

ConcreteTile

Wall

Cinder/BlockCinder/Block

Ceiling

AcousticalAcoustical

Structural System

Framing

SteelSteel

Wall

BlockBlock

Doors

Overhead (w x h)

9'9" x 9'6"0

Exterior (w x h)

3'7" x 7'0

Interior (w x h)

6' x 7'3' x 7'

Windows

Window area

970

Height off floor

7'32"

Electrical Features

Lighting

Type fixtures

Floor./Susp.Floor./Susp.

Number switches

41

Light scheme

IndividualSet

Power

Wall outlets

No. outlets

* 63

Height/space

18" / 9'18" / 15'

Voltage(s)

110110

Machine outlets

No. outlets

200

Service (cng./flr.)

C/ng./wall0

Voltage(s)

220/1100

No. outside outlets

10

Master control

10

Panic button

40

Electronic Features

Intercom (1w, 2w, o)

2w2w

Telephone service

yesyes

TV service

00

Electronic sensors

00

* Plus 4 Extension From Ceiling on Movable Track.

Mechanical FeaturesHVAC systems

Energy source(s)	<u>Electric</u>	<u>Electric</u>	_____	_____	_____
Type heat system	<u>Electric</u>	<u>electric</u>	_____	_____	_____
Station regulation of HV ...	<u>yes</u>	<u>yes</u>	_____	_____	_____
Air conditioned	<u>No</u>	<u>No</u>	_____	_____	_____

Plumbing service

Water service	<u>yes</u>	<u>No</u>	_____	_____	_____
Drinking fountain	<u>No</u>	<u>No</u>	_____	_____	_____
Lavatory	<u>No</u>	<u>No</u>	_____	_____	_____
Floor drain(s)	<u>yes - 1</u>	<u>No</u>	_____	_____	_____
Hose bibs	<u>yes - 1</u>	<u>No</u>	_____	_____	_____
Outside water service	<u>yes - 1</u>	<u>No</u>	_____	_____	_____

Gas Service

Availability	<u>yes</u>	<u>No</u>	_____	_____	_____
Type service	<u>Bottle</u>	<u>No</u>	_____	_____	_____
No. gas outlets	<u>6</u>	<u>0</u>	_____	_____	_____
Master control	<u>yes</u>	<u>0</u>	_____	_____	_____

Compressed air service

Availability	<u>yes</u>	<u>No</u>	_____	_____	_____
No. disconnect outlets	<u>4</u>	<u>0</u>	_____	_____	_____
Outside air service	<u>0</u>	<u>0</u>	_____	_____	_____

Health and Safety FeaturesHealth

Convenient restrooms	<u>yes</u>	<u>yes</u>	_____	_____	_____
Lockers available	<u>yes</u>	<u>yes</u>	_____	_____	_____
Convenient drinking fountain	<u>yes</u>	<u>yes</u>	_____	_____	_____
Convenient hand washing	<u>yes</u>	<u>yes</u>	_____	_____	_____
Dust-fume removal	<u>yes</u>	<u>No</u>	_____	_____	_____
Special ventilation	<u>yes</u>	<u>yes</u>	_____	_____	_____

Safety

Fire ext. available	<u>yes</u>	<u>No</u>	_____	_____	_____
Sprinkler system	<u>No</u>	<u>No</u>	_____	_____	_____
Exit markings	<u>No</u>	<u>No</u>	_____	_____	_____
Alarm system	<u>yes</u>	<u>yes</u>	_____	_____	_____
Clear traffic lanes	<u>yes</u>	<u>yes</u>	_____	_____	_____
Good security	<u>yes</u>	<u>yes</u>	_____	_____	_____

Barrier Free Features

Special equipment	<u>yes</u>	<u>0</u>	_____	_____	_____
Equipment operability	<u>yes</u>	<u>0</u>	_____	_____	_____
Adequate entrances-exits	<u>yes</u>	<u>yes</u>	_____	_____	_____
Adequate "V" movement	<u>yes</u>	<u>yes</u>	_____	_____	_____

Special Equipment Features

Specify <u>Welding Ind. Venting</u> ...	<u>✓</u>	_____	_____	_____	_____
Specify <u>on Wood Wkg. Eq. Ind. Dust Col.</u>	<u>✓</u>	_____	_____	_____	_____
Specify <u>Tool Room Area</u> ...	<u>✓</u>	_____	_____	_____	_____

Other Feature(s)

Specify _____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

by:

W. H. Hunsack

107

date:

5-23-78

ACCEPTABILITY

- ① 2 3 4 1. Compatibility with others in area
 ① 2 3 4 Business/industry compatibility
 ① 2 3 4 Residential compatibility
 ① 2 3 4 Services compatibility
- 1 ② 3 4 2. Conditions of site surroundings
 ① 2 3 4 Risk free/safe place
 1 ② 3 4 Security provisions
 1 ② 3 4 Zoning law protection
- ① 2 3 4 3. Traffic flow tolerability
 ① 2 3 4 Traffic disruption tolerability
 ① 2 3 4 Traffic noise tolerability
 ① 2 3 4 Traffic congestion tolerability
- ① 2 3 4 4. Hazard freeness of surrounding areas
 ① 2 3 4 Pedestrian traffic routes
 ① 2 3 4 Traffic crossing controls
 ① 2 3 4 Route safety to area
- ① 2 3 4 5. Sub-group identity with area
 ① 2 3 4 Age groups
 ① 2 3 4 Socio-economic groups
 ① 2 3 4 Racial groups
- ① 2 3 4 6. Neighborhood desirability
 ① 2 3 4 Commercial-industrial fit
 ① 2 3 4 Rural-farm area fit
 ① 2 3 4 Residential area fit
- ① 2 3 4 7. Environmental Quality of Area
 ① 2 3 4 Dust-dirt freeness
 ① 2 3 4 Fume-odor freeness
 ① 2 3 4 Noise tolerability

ACCESSIBILITY

- 1 ② 3 4 8. Convenience to public services
 1 ② 3 4 Fire services
 1 ② 3 4 Police services
 1 ② 3 4 Transportation services
- ① 2 3 4 9. Convenience to public utilities
 ① 2 3 4 Electricity
 1 ② 3 4 Gas
 ① 2 3 4 Water and sewer
- ① 2 3 4 10. Barrier freeness of site approaches for handicapped
 ① 2 3 4 Common level-gentle slope walks
 ① 2 3 4 Clear vision traffic lanes
 1 ② 3 4 Non-slip surfaces

RATING SCALE1 - Good
3 - Poor108 2 - Average
4 - Cannot judge or doesn't apply

- 1 2 ③ 4 11. Convenience to users of facility
 1 2 3 ④ Persons who walk
 1 2 ③ 4 Persons who are transported publicly
 ① 2 3 4 Persons who commute privately
- 1 2 ③ 4 12. Approach to the site
 ① 2 3 4 Roads to site
 1 2 3 ④ Walks to site
 1 2 3 ④ Bike lanes to site
- 1 ② 3 4 13. Site entry-exit efficiency
 1 ② 3 4 Entry-exit convenience
 1 ② 3 4 Entry-exit controls
 1 ② 3 4 Entry-exit safety

SUITABILITY

- ① 2 3 4 14. Desirability of site contour
 ① 2 3 4 Elevation
 ① 2 3 4 Surface drainage
 ① 2 3 4 Erosion controllability
- 1 ② 3 4 15. Adequacy of soil structure
 1 ② 3 4 Porous sub-soil
 1 ② 3 4 Soil base
 ① 2 3 4 Ease of surface adaptation
- ① 2 3 4 16. Potential for site adaptation and preparation
 ① 2 3 4 w/o extensive fill and cutting
 1 ② 3 4 w/o extensive drain pits and shoring
 ① 2 3 4 w/o extensive retaining walls
- ① 2 3 4 17. Impact of site to area
 ① 2 3 4 Site aesthetics
 ① 2 3 4 Seclusion of unsightly places
 ① 2 3 4 Potential for landscaping
- ① 2 3 4 18. Dimension-layout acceptability
 ① 2 3 4 Size in acres
 ① 2 3 4 Shape of width to length
 ① 2 3 4 Space utilization potential

DEVELOPMENT

- ① 2 3 4 19. Building placement(s) on site
 ① 2 3 4 Building orientation(s)
 ① 2 3 4 Buildings placed back from street
 ① 2 3 4 Feasibility for site arrangements
- ① 2 3 4 20. Status of landscaping
 ① 2 3 4 Building-site appearance
 ① 2 3 4 Plantings-vegetation condition
 ① 2 3 4 Grounds care condition

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 3 4 21. Site surfaces planning
 ① 2 3 4 All-weather surfacing
 ① 2 3 4 Turf areas
 ① 2 3 4 Apparatus areas
- 3 4 22. Vehicular traffic drives
 ① 2 3 4 Double lane drives with turnarounds
 ① 2 3 4 Clear vision w/o circling building
 ① 2 3 4 Building service drives
- 3 4 23. Status of parking areas
 ① 2 3 4 Lot(s)-spaces available
 ① 2 3 4 Accessibility to building entrances
 ① 2 3 4 Space width adequacy (handicapped)
- 3 4 24. Pedestrian traffic walks
 1 2 3 ④ Width of walks
 ① 2 3 4 Common level on gentle ramps of walk
 1 ② 3 4 Non-slip surfaces & railings if needed
- 3 4 25. Vehicle disembarking and facility entry ramps
 1 2 3 ④ On-site bus stops
 1 ② 3 4 Level platforms/unloading docks
 ① 2 3 4 Disembarking/unloading convenience
- 3 4 26. Site safety-security
 ① 2 3 4 Lighting adequacy
 1 ② 3 4 Traffic controls and markings
 1 ② 3 4 Suitable fences and storage
- 3 4 27. Site layout and allocations
 ① 2 3 4 Instructional area allocations
 1 2 3 ④ Play-court-athletic allocations
 ① 2 3 4 Use of areas w/o conflict

Recapitulation of Site AssessmentCOMPONENTSRATING SCALE

		HS	S+	S	S-	US
<u>Acceptability</u>	28- Location for a school site	①	2	3	4	5
	29- Health, safety, and security	1	②	3	4	5
	30- Compatibility with area	⑦	2	3	4	5
<u>Accessibility</u>	31- Convenience to users	1	2	③	4	5
	32- Convenience to services and utilities	1	②	3	4	5
	33- Traffic patterns and flow	①	2	3	4	5
<u>Suitability</u>	34- Site size and shape	①	2	3	4	5
	35- Terrain and topography	①	2	3	4	5
	36- Distinctive planning possibilities	①	2	3	4	5
<u>Development</u>	37- Site surfaces and landscaping	①	2	3	4	5
	38- Drives, walks, and parking	①	2	3	4	5
	39- Layout and allocations	①	2	3	4	5
<u>Specifications</u>	40- <u>Site features overall adequacy</u>	①	2	3	4	5
	41- <u>Site improvement overall adequacy</u>	①	2	3	4	5

RATING SCALE

HS - Highly Satisfactory (1)
 S+ - Satisfactory plus (2)
 S - Satisfactory (3)
 S- - Satisfactory minus (4)
 US - Unsatisfactory (5)

SPATIAL COMPONENT

- ① 2 3 4 42. Availability of appropriate unit areas
 ① 2 3 4 Association among units
 ① 2 3 4 Design of spaces for special use
 1 ② 3 4 Adaptability/modifiability of spaces
- ① 2 3 4 43. Adequacy of unit sizes
 ① 2 3 4 Size to shape of spaces
 ① 2 3 4 Unobstructed heights of spaces
 1 ② 3 4 Instructional to non-instructional areas
- ① 2 3 4 44. Accessibility to related areas
 ① 2 3 4 Convenience to personal care areas
 ① 2 3 4 Convenience to instructional centers
 ① 2 3 4 Convenience to service areas
- ① 2 3 4 45. Movement and natural fit of spaces
 ① 2 3 4 Movement within areas
 ① 2 3 4 Movement of equipment and materials
 ① 2 3 4 Indoor-outdoor arrangements

SONIC COMPONENT

- ① 2 3 4 46. Adequacy of sound-conditioning features
 ① 2 3 4 Building envelope treatments
 1 ② 3 4 Special acoustical treatments
 ① 2 3 4 Unwanted sound restrictions
- ① 2 3 4 47. Quality of hearing environment
 ① 2 3 4 Wanted sounds clearly heard
 ① 2 3 4 Tolerability levels of sound transmission
 1 ② 3 4 Adequacy of sound cushioning and muffling
- ① 2 3 4 48. Adequacy of sound control
 1 ② 3 4 Isolation of noise producing activities
 ① 2 3 4 Air borne noise tolerability
 ① 2 3 4 Structure borne noise tolerability

THERMAL COMPONENT

- ① 2 3 4 49. Thermal adequacy based on need
 ① 2 3 4 Heat sufficiency
 ① 2 3 4 Ventilation sufficiency
 1 ② 3 4 Cooling sufficiency
- 1 ② 3 4 50. Regulation for climate control
 1 ② 3 4 Ability to change to heat demand
 ① 2 3 4 System zoning for partial use
 1 ② 3 4 Response of system to outside conditions

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- ② 3 4 51. Structural-thermal efficiency
 1 ② 3 4 Design support for thermal efficiency
 1 ② 3 4 Equipment support for thermal efficiency
 1 ② 3 4 Low conductance and high resistance
- VISUAL COMPONENT
- 2 3 4 52. Adequacy of illumination for visual comfort
 ① 2 3 4 Brightness level
 ① 2 3 4 Ceiling-wall-floor reflection values
 1 ② 3 4 Task control of illumination
- ② 3 4 53. Adjustment-regulation for visual control
 1 ② 3 4 Availability of multiple control switches
 1 ② ④ 4 Provision of rheostats where needed
 1 ② 3 4 Regulation of natural light
- ② 3 4 54. Flexible and economical light system
 1 ② 3 4 Low brightness of large areas by luminaires
 ① 2 3 4 Lighting responsiveness to space changes
 1 ② 3 4 Energy efficiency of illumination

HYGIENIC COMPONENT

- ② 3 4 55. Personal care and conveniences for facility users
 1 ② 3 4 Restrooms conveniently accessible
 ① 2 3 4 Restroom availability for both sexes
 1 ② 3 4 Restroom provisions for handicapped
- ② 3 4 56. Design of lavatory-toilet facilities
 ① 2 3 4 Clean and sanitary (w/o odor)
 1 2 3 ④ Use of impervious materials
 ① 2 3 4 Entrance-exit shielding
- ② 3 4 57. Availability of special hand washing facilities
 1 ② 3 4 Number of open hand washing facilities
 1 ② 3 4 Placement of open lavatories
 1 ② 3 4 Operable by handicapped
- 2 3 4 58. Availability of lockers and shelves
 ① 2 3 4 Space for personal item storage
 1 ② 3 4 Lockers for special clothing storage
 ① 2 3 4 Location/ventilation of lockers

SAFETY COMPONENTS

- 2 3 4 59. Precautions for hazards from fumes
 1 ② 3 4 Noxious materials storage
 ① 2 3 4 Hood and shield protection devices
 ① 2 3 4 Devices to handle dangerous materials
- 2 3 4 60. Special hazard minimizing equipment
 1 2 3 ④ Explosion proof electrical fixtures
 1 ② 3 4 Special exhaust fans
 1 2 3 ④ Electronic sensors

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 ④ - Cannot judge or doesn't apply

- 1) 2 3 4 61. Safe movement of people in facility
 ① 2 3 4 Clear traffic lanes (w/o projections)
 ① 2 3 4 Traffic lanes lead to foyers and exits
 ① 2 3 4 V-H traffic flow for handicapped
- 1 ② 3 4 62. Adequacy of fire safety conditions
 1 ② 3 4 Controls for combustible gases
 ① 2 3 4 Adequacy of number/types of circuits
 1 ② 3 4 Storage-disposal of combustibles
- 1 ② 3 4 63. Physical shape of facility for safety
 ① 2 3 4 Structural soundness for safety
 1 ② 3 4 Secure-shock proof connections
 1 ② 3 4 Working condition of operable parts
- 1 ② 3 4 64. Adequacy of safety control equipment
 1 ② 3 4 Emergency and fire doors
 1 ② 3 4 Location and marking of extinguishers
 1 ② 3 4 Adequacy of emergency lighting

TRAFFIC FLOW COMPONENT

- ① 2 3 4 65. Efficiency of traffic flow in corridors
 ① 2 3 4 Traffic handling w/o congestion
 ① 2 3 4 Corridors clearly distinguishable
 ① 2 3 4 Corridor size for traffic load
- 1 ② 3 4 66. Personnel-equipment movement in corridors
 ① 2 3 4 Clear of obstructions and projections
 1 ② 3 4 Non-slip treatment of floors
 1 ② 3 4 Accommodate movement of handicapped
- 1 2 3 ④ 67. Personnel-equipment movement to different levels
 1 2 3 ④ Handling 2-way traffic on stairs
 1 2 3 ④ Ramps have gentle slope
 1 2 3 ④ Elevators for equipment and handicapped
- 1 2 3 ④ 68. Adequacy of stair-well features
 1 2 3 ④ Availability of firm handrails
 1 2 3 ④ Non-skid surfaces of stairs
 1 2 3 ④ Nosing-height features of stairs
- 1 2 3 ④ 69. Design of vertical movement features
 1 2 3 ④ Location of stairs to exits
 1 2 3 ④ Intermittent platforms for stairs
 1 2 3 ④ Control-safety design of stair wells
- 1 ② 3 4 70. Efficiency of ingress-egress from facility
 ① 2 3 4 Exit unit width of doors
 1 ② 3 4 Ease of opening doors
 1 ② 3 4 Door closure operation
- 1 ② 3 71. Adequacy of door features
 ① 2 3 4 One-level exit platforms
 1 ② 3 4 Operation of anti-panic hardware
 1 ② 3 4 Day-night markings of exits

RATING SCALE

1 - Good
 3 - Poor

2 - Average

4 - Cannot judge or doesn't apply

- 1 2 3 4 72. Efficiency of internal traffic movement
 ① 2 3 4 Traffic changes and dispersals
 ① 2 3 4 Movement within suites and among areas
 1 ② 3 4 Movement of equipment and freight
- 1 ② 3 4 73. Efficiency of external traffic movement
 1 ② 3 4 Location of exits for traffic flow
 1 ② 3 4 Crowd movement out of facility
 ① 2 3 4 Dispersals from parking areas

EQUIPMENT COMPONENT

- ① 2 3 4 74. Adequacy of electrical service for task demands
 ① 2 3 4 Meeting power requirements
 ① 2 3 4 Accessibility of power source to equipment
 ① 2 3 4 Dependability/controllability of power
- 1 ② 3 4 75. Adequacy of gas service for task demands
 1 ② 3 4 Meeting gas requirements
 1 ② 3 4 Accessibility of gas outlets
 1 ② 3 4 Dependability/controllability of gas service
- 1 ② 3 4 76. Adequacy of compressed air for task demands
 1 ② 3 4 Meeting air requirements
 1 ② 3 4 Accessibility of dis-connect outlets
 1 ② 3 4 Dependability/controllability of air service
- ① 2 3 4 77. Adequacy of water service to meet task demands
 ① 2 3 4 Meeting quality-quantity requirements
 1 ② 3 4 Availability of service equipment
 ① 2 3 4 Dependability/controllability of water service
- 1 2 3 ④ 78. Adequacy of electronic installations for task demands
 1 2 3 ④ Conduit for communication terminals
 1 2 3 ④ AV/TV/computer connections/distributions
 1 ② 3 4 Terminals for clocks/intercoms/telephones
- 1 ② 3 4 79. Adequacy of special equipment needs
 1 ② 3 4 Special exhaust systems
 1 2 3 ④ Filtered-humidity controlled air
 1 ② 3 4 Special drainage systems

STRUCTURAL COMPONENT

- ① 2 3 4 80. Adequacy/durability of structural support system
 ① 2 3 4 Weight support/load bearing capacity
 ① 2 3 4 Minimal contraction-expansion problems
 1 ② 3 4 Spanning provides partition flexibility
- ① 2 3 4 81. Adequacy of external wall treatments
 ① 2 3 4 Rigid, safe, and wear resistant
 1 ② 3 4 Control of thermal conductance
 ① 2 3 4 Efficiency for maintenance

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 1 2 3 4 82. Adequacy of internal wall technical qualities
 ① 2 3 4 Partitions tight w/o vibrations
 ① 2 3 4 Tolerability of noise transfer
 ① 2 3 4 Facing and fire-rating quality
- ① 2 3 4 83. Adequacy of interior wall functional qualities
 ① 2 3 4 Reflections complement lighting
 1 ② 3 4 Acoustical properties
 ① 2 3 4 Aesthetics of finishes
- 1 ② 3 4 84. Adequacy of ceiling technical qualities
 1 ② 3 4 Strength of suspension w/o air leakage
 1 ② 3 4 Shape support of acoustics
 ① 2 3 4 Ease of repair and maintenance
- ① 2 3 4 85. Adequacy of ceiling functional qualities
 ① 2 3 4 Reflective quality supports lighting
 ① 2 3 4 Absorbent quality supports hearing
 ① 2 3 4 Aesthetic quality
- ① 2 3 4 86. Adequacy of technical floor treatments
 ① 2 3 4 Treatment varies by use
 ① 2 3 4 Wear qualities
 ① 2 3 4 Appropriateness of resiliency
- 1 ② 3 4 87. Adequacy of functional floor treatments
 ① 2 3 4 Appearance
 1 ② 3 4 Acoustical quality
 1 ② 3 4 Reflective features
- 1 ② 3 4 88. Adequacy of roof and roof deck
 1 ② 3 4 Waterproofness of roofing system
 1 ② 3 4 Handling of roof load
 1 ② 3 4 Span, fire-rating, insulating qualities
- ① 2 3 4 89. Adequacy of foundation support system
 ① 2 3 4 Durability
 ① 2 3 4 Waterproofness
 1 ② 3 4 Appropriateness of insulation
- ① 2 3 4 90. Adequacy of structural envelope
 ① 2 3 4 Fire, wear, weather, and sound properties
 ① 2 3 4 Design, shape, appearance, and materials
 ① 2 3 4 Appropriateness of doors and windows

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

Recapitulation of Building AssessmentCOMPONENTSRATING SCALE

		HS	S+	S	S-	US
<u>Spatial</u>	91- Unit stations and layout	①	2	3	4	5
	92- Unit sizes (l x w x h)	1	②	3	4	5
<u>Sonic</u>	93- Quality of sound	1	2	③	4	5
	94- Noise control	1	2	③	4	5
<u>Thermal</u>	95- Climate control (HVAC)	1	2	②	4	5
	96- Energy sources and efficiency	1	2	③	4	5
<u>Visual</u>	97- Lighting adequacy/controllability	1	②	3	4	5
	98- Visual flexibility/efficiency	1	②	3	4	5
<u>Hygienic</u>	99- Personal care convenience	1	2	③	4	5
	100- Design features support for health	1	2	③	4	5
<u>Safety</u>	101- Hazard controls (fumes, fire, explosion) ...	1	2	③	4	5
	102- Structural-equipment conditions for safety ..	1	②	3	4	5
<u>Traffic-flow</u>	103- Internal movement (H/V people/equipment)	①	2	3	4	5
	104- External movement (people/vehicular)	①	2	3	4	5
<u>Equipment</u>	105- Public utilities and services	1	2	③	4	5
	106- Special equipment installations	1	②	3	4	5
<u>Structural</u>	107- Durability of structural envelope	①	2	3	4	5
	108- Design treatments	①	2	3	4	5
<u>Specifications</u>	109- Construction features overall adequacy	①	2	3	4	5
	110- Education features overall adequacy	①	2	3	4	5

RATING SCALE

HS - Highly Satisfactory (1)
 S+ - Satisfactory plus (2)
 S - Satisfactory (3)
 S- - Satisfactory minus (4)
 US - Unsatisfactory (5)

211
Austin E. Walker
CENTER FOR CAREER EDUCATION

Gene D. Crosier
Department
Chairman

9651 East 21st Street
Indianapolis, Indiana 46229

Phone:
(317) 899-2000

DEPARTMENT OF INDUSTRIAL EDUCATION

June 12, 1978

Dr. Norbert J. Nelson
Educational Administration
F-15 South Campus Courts
Purdue University
West Lafayette Indiana 47907

Dear Dr. Nelson:

Enclosed you will find the completed inspection forms for two vocational programs, site assessment forms, building assessment forms, and my claim form as per your request in your letter of May 12, 1978.

I found the inspection forms to be adequate for one program each because of the number of rooms available for each program in our building. The directions stated that as many as five programs could be put on each form. I found it difficult to give the information I thought necessary when using only one column per program. For example, I feel that ceiling heights and accoustics need to be different for classrooms and offices than for the shop areas. Some areas may need to be air conditioned and some may not. Electrical outlets may need to be at a different height in the classroom than in the shop. The variety of electrical voltages and phases needs more room. Otherwise I think the inspection forms are very good.

The site assessment and the building assessment sections are very good. I hope this sampling will be of help to you.

Sincerely yours,

Gene D. Crosier
Gene D. Crosier

P.S. If you wish to contact me during the summer months please contact me at home:

1726 N. Fogelson Drive
Indianapolis, Indiana 46229 Phone: 317-894-6611

THE METROPOLITAN SCHOOL DISTRICT OF WARREN TOWNSHIP

Airbrush
Technology

Architectural
Drafting

Electricity
Electronics

Graphic Arts
Printing

Machine Shop

Mechanical
Drafting

Photography

Power Mechanics

Woodworking

**VOCATIONAL
COURSES**

Auto Body

Auto Mechanics

Building Trades

Diesel
Mechanics

Machine Trades

Radio/TV/
Electronics

Printing

Welding

EXHIBIT _____

School Institution: M.S.D. of Warren Twp.Building/Site: Walker Career CenterLocation: 9651 E. 21st Street
Indianapolis, Indiana 46229Bldg./Site Use: Local Career CenterStudent Levels: 10-11-12Total No. Students: Approx. 2500ID Code: 5 3 6 3
InstitutionBldg./Site No. ?Marion
County5
Region

GENERAL DATA

BUILDING INFORMATION

Building Area (sq. ft.) 160,000Explain: ArchitectConstruction: Date PurposeOriginal August, 1976 - Career CenterAddition(s) _____

Type Facility (check one)

Area Vocational School _____

Comprehensive High School _____

Other (specify) Local Career Center

Number of Floors

Below Ground _____

Above Ground 2Total Number 2

SITE INFORMATION

Site size (acres) 150 Acres

Shape of site: square _____;

rectangular _____; irregular ☒Acres contiguous: Yes ☒; No _____

Site Status (check one)

Being considered _____

Owned (being used) _____ ☒

Owned (not being used) _____

No. Bldgs. on Site 6

COST INFORMATION

Site value 1,200,000 Act _____; Est ☒Bldg. value 6,720,000 Act _____; Est ☒

Explain Bldg. value figure

does not include price of
2,300,000 for equipping.

COMMENTS:

by: Henry W. Currierdate: 6/12/78

INSPECTION FORM

EXHIBIT

Vocational
Program Area Welding
Institution Walker Career Center

Identification

Station Number 314
Number Student Stations 24

Spatial Features

Type (Clim, Lab, Shop) Shop
Size (area) 4000
Width 60'
Length 66'-8"
Height 18'
Storage (w x l) 18' x 8'8"

Locker	Supply	Instruction
Room	stock	office
224	823	120
11'	21'	10'
20'-4"	39'-4"	12'
8'8"	8'8"	8'8"

TOTAL SQ. ft. - 5716

Construction Features

Treatments (interior) concrete
Floor vinyl
Wall Tile
Ceiling concrete
Structural System concrete
Framing vinyl
Wall Tile

concrete vinyl concrete concrete vinyl
Tile Tile Tile Tile Tile
Epoxy Painted Concrete Block
Exposed Acoustical Acoustical Exposed Acoustical
Skeletal
Brick face w/interior block

Doors
Overhead (w x h) 10'x10'
Exterior (w x h) 6'x7 1/2'
Interior (w x h) 34"x7'-2"
Windows
Window area 78 sq. ft.
Height off floor 30"

34"x7'-2" 34"x7'-2" 6' 39"x7'-2" 34"x7'-2"
78 sq. ft.
30"

Electrical Features

Lighting
Type fixtures Fluorescent
Number switches Fluor.
Light scheme Fluor.

Fluorescent Fluor. Fluor. Fluor. Fluor.
High Brightness w/ individual machine lights

Power
Wall outlets
No. outlets 36
Height/space 4'10"
Voltage(s) 115
Machine outlets
No. outlets 28
Service (cng./flr.) ceiling
Voltage(s) 408 10 + 34
No. outside outlets 4
Master control yes
Panic button yes

36 6 4 3
4'10" 18'1 1/2' 18'1 1/2' 18'1 1/2'
115 115 115 115
28
ceiling
408 10 + 34
4
yes
yes

Electronic Features

Intercom (1w, 2w, o) 2w
Telephone service yes
TV service no
Electronic sensors no

2w yes no no

Mechanical FeaturesHVAC systems

	Shop	Classroom	Lock + Restroom	Supply + Storage	Instructor's Office
Energy source(s)	oil	-	-	-	-
Type heat system	hot water	-	-	-	-
Station regulation of HV ...	1 Yes	1 Yes	Zone	1-Yes	1 Yes
Air conditioned	No	Yes	No	No	Yes

Plumbing service

Water service	H+C	0	H+C	C	0
Drinking fountain	Yes	-	-	-	-
Lavatory	Yes	-	Yes	-	-
Floor drain(s)	Yes	-	Yes	Yes	-
Hose bibs	Yes	-	-	Yes	-
Outside water service	Yes	-	-	-	-

Gas Service

Availability	Yes	-	-	-	-
Type service	Natural	plus piped in Acetylene, Argon, + Oxygen	-	-	-
No. gas outlets	1-natural - 20 ea of others	-	-	-	-
Master control	No-Natural - Yes others	-	-	-	-

Compressed air service

Availability	Yes	-	-	-	-
No. disconnect outlets	20	-	-	-	-
Outside air service	Yes - piped directly in from Boiler Room.	-	-	-	-

Health and Safety FeaturesHealth

Convenient restrooms	Yes	-	-	-	-
Lockers available	Yes	-	-	-	-
Convenient drinking fountain	Yes	-	-	-	-
Convenient hand washing	Yes	-	-	-	-
Dust-fume removal	Yes	-	-	-	-
Special ventilation	Yes - but not adequate for filtering out smoke & fumes	-	-	-	-

Safety

Fire ext. available	Yes	-	-	-	-
Sprinkler system	No	-	-	-	-
Exit markings	No	-	-	-	-
Alarm system	Yes	-	-	-	-
Clear traffic lanes	Yes	-	-	-	-
Good security	Yes	-	-	-	-

Carrier Free Features

Special equipment	Yes	-	-	-	-
Equipment operability	Yes	-	-	-	-
Adequate entrances-exits	Yes	-	-	-	-
Adequate H-V movement	Yes	-	-	-	-

Special Equipment Features

Specify	-	-	-	-	-
Specify	-	-	-	-	-
Specify	-	-	-	-	-

Other Feature(s)

Specify	-	-	-	-	-
Specify	-	-	-	-	-

by:

Gene H. Crozier

121

date:

6/12/78

INSPECTION FORM

EXHIBIT

Vocational
Program Area Machine Trades
Institution Walker Career Center

Identification

Station Number 313
Number Student Stations 24

Spatial Features

Type (Clim, Lab, Shop)	Shop	Classroom	Locker/Restroom	Supply Stock Storage	Instructors Office
Size (area)	5000	547	224	623	120
Width	60'	20'-4"	11'	21'	10'
Length	83'-4"	27'	20'-4"	39'-4"	12'
Height	18'	8'-8"	8'-8"	8'-8"	8'-8"
Storage (w x l)					

TOTAL SQ. FT. - 6716

Construction Features

Treatments (interior)	concrete	viny/rubber tile	concrete	concrete	viny/rubber tile
Floor	↓	↓	↓	↓	↓
Wall	Epoxy Painted	concrete block	—	—	—
Ceiling	exposed	Acoustic Tile	Acoustic Tile	Exposed	Acoustic Tile

Structural System

Framing	Skeletal				
Wall	Brick face w/interior block				
Doors					
Overhead (w x h)	10' x 10'				
Exterior (w x h)	6' x 7'-2"				
Interior (w x h)	34" x 7'-2"	34" x 7'-2"	6'	39" x 7'-2"	34" x 7'-2"

Windows

Window area		78 sq. ft.			
Height off floor		30"			

Electrical Features

Lighting	Fluorescent	Fluor.	Fluor.	Fluor.
Type fixtures	Fluorescent <td>Fluor. <td>Fluor. <td>Fluor. </td></td></td>	Fluor. <td>Fluor. <td>Fluor. </td></td>	Fluor. <td>Fluor. </td>	Fluor.
Number switches	1	2	1	1
Light scheme	High Brightness w/	individual	machine	lighting

Power

Wall outlets				
No. outlets	26	6	5	3
Height/space	42" / 3'-16"	18" x 24" / 6'	18" / 12"	18" / 10'
Voltage(s)	25(115) / 1(208)	115	115	115
Machine outlets				
No. outlets	39			
Service (cng./flr.)	ceiling			
Voltage(s)	115-180 + 480 3Ø			
No. outside outlets				
Master control	Yes			
Panic button	Yes (2)			

Electronic Features

Intercom (1w, 2w, o)	2w			
Telephone service				Yes
TV service	No.			
Electronic sensors	No.			

Mechanical FeaturesHVAC systems

	<u>Shop</u>	<u>Classroom</u>	<u>Lockers Restroom</u>	<u>Supply Storage</u>	<u>Instructor's Office</u>
Energy source(s)	oil				
Type heat system	hot water				
Station regulation of HV ...	Yes	Yes	Zone	Yes	Yes
Air conditioned	No.	YES	No.	No.	YES.

Plumbing service

Water service	H+C	0	H+C	OC	0.
Drinking fountain	Yes				
Lavatory	Yes		Yes		
Floor drain(s)	Yes		Yes	Yes	
Hose bibs	Yes			Yes	
Outside water service	Yes				

Gas Service

Availability	Yes				
Type service	Natural				
No. gas outlets	1				
Master control	No				

Compressed air service

Availability	Yes				
No. disconnect outlets	33				
Outside air service	Yes - piped directly in from Boiler Room				

Health and Safety FeaturesHealth

Convenient restrooms	Yes				
Lockers available	Yes				
Convenient drinking fountain	Yes				
Convenient hand washing	Yes				
Dust-fume removal	Yes				
Special ventilation	Yes				

Safety

Fire ext. available	Yes				
Sprinkler system	No				
Exit markings	No				
Alarm system	Yes				
Clear traffic lanes	Yes				
Good security	Yes				

Barrier Free Features

Special equipment	Yes				
Equipment operability	Yes				
Adequate entrances-exits	Yes				
Adequate H-V movement	Yes				

Special Equipment Features

Specify					
Specify					
Specify					

Other Feature(s)

Specify					
Specify					

by:

Gene H. Crozier

12 Date:

6/12/78

IT _____

TABILITY

- 3 4 1. Comptability with others in area
 ① 2 3 4 Business/industry compatibility
 ① 2 3 4 Residential compatibility
 ① 2 3 4 Services compatibility
- 3 4 2. Conditions of site surroundings
 ① 2 3 4 Risk free/safe place
 ① 2 3 4 Security provisions
 ① 2 3 4 Zoning law protection
- 3 4 3. Traffic flow tolerability
 ① 2 3 4 Traffic disruption tolerability
 ① 2 3 4 Traffic noise tolerability
 ① 2 3 4 Traffic congestion tolerability
- 3 4 4. Hazard freeness of surrounding areas
 ① 2 3 4 Pedestrian traffic routes
 ① 2 3 4 Traffic crossing controls
 ① 2 3 4 Route safety to area
- 3 4 5. Sub-group identity with area
 ① 2 3 4 Age groups
 ① 2 3 4 Socio-economic groups
 ① 2 3 4 Racial groups
- 3 4 6. Neighborhood desirability
 ① 2 3 4 Commercial-industrial fit
 ① 2 3 4 Rural-farm area fit
 ① 2 3 4 Residential area fit
- 3 4 7. Environmental Quality of Area
 ① 2 3 4 Dust-dirt freeness
 ① 2 3 4 Fume-odor freeness
 ① 2 3 4 Noise tolerability

SIBILITY

- 3 4 8. Convenience to public services
 ① 2 3 4 Fire services
 ① 2 3 4 Police services
 ① 2 3 4 Transportation services
- 3 4 9. Convenience to public utilities
 ① 2 3 4 Electricity
 ① 2 3 4 Gas
 ① 2 3 4 Water and sewer
- 3 4 10. Barrier freeness of site approaches for handicapped
 ① 2 3 4 Common level-gentle slope walks
 ① 2 3 4 Clear vision traffic lanes
 ① 2 3 4 Non-slip surfaces

SCALE

1 - Good

3 - Poor

12 - Average

- 2 3 4 11. Convenience to users of facility
 (1) 2 3 4 Persons who walk
 (1) 2 3 4 Persons who are transported publicly
 (1) 2 3 4 Persons who commute privately
- 2 3 4 12. Approach to the site
 (1) 2 3 4 Roads to site
 (1) 2 3 4 Walks to site
 (1) 2 3 4 Bike lanes to site
- 2 3 4 13. Site entry-exit efficiency
 (1) 2 3 4 Entry-exit convenience
 (1) 2 3 4 Entry-exit controls
 (1) 2 3 4 Entry-exit safety

HABITABILITY

- 2 3 4 14. Desirability of site contour
 (1) 2 3 4 Elevation
 (1) 2 3 4 Surface drainage
 (1) 2 3 4 Erosion controllability
- 2 3 4 15. Adequacy of soil structure
 (1) 2 3 4 Porous sub-soil
 (1) 2 3 4 Soil base
 (1) 2 3 4 Ease of surface adaptation
- 2 3 4 16. Potential for site adaptation and preparation
 (1) 2 3 4 w/o extensive fill and cutting
 (1) 2 3 4 w/o extensive drain pits and shoring
 (1) 2 3 4 w/o extensive retaining walls
- 2 3 4 17. Impact of site to area
 (1) 2 3 4 Site aesthetics
 (1) 2 3 4 Seclusion of unsightly places
 (1) 2 3 4 Potential for landscaping
- 2 3 4 18. Dimension-layout acceptability
 (1) 2 3 4 Size in acres
 (1) 2 3 4 Shape of width to length
 (1) 2 3 4 Space utilization potential

DEVELOPMENT

- 2 3 4 19. Building placement(s) on site
 (1) 2 3 4 Building orientation(s)
 (1) 2 3 4 Buildings placed back from street
 (1) 2 3 4 Feasibility for site arrangements
- 2 3 4 20. Status of landscaping
 (1) 2 3 4 Building-site appearance
 (1) 2 3 4 Plantings-vegetation condition
 (1) 2 3 4 Grounds care condition

SCALING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 2 3 4 21. Site surfaces planning
 (1) 2 3 4 All-weather surfacing
 (1) 2 3 4 Turf areas
 (1) 2 3 4 Apparatus areas
- 2 3 4 22. Vehicular traffic drives
 (1) 2 3 4 Double lane drives with turnarounds
 (1) 2 3 4 Clear vision w/o circling building
 (1) 2 3 4 Building service drives
- 2 3 4 23. Status of parking areas
 (1) 2 3 4 Lot(s)-spaces available
 (1) 2 3 4 Accessibility to building entrances
 (1) 2 3 4 Space width adequacy (handicapped)
- 2 3 4 24. Pedestrian traffic walks
 (1) 2 3 4 Width of walks
 (1) 2 3 4 Common level on gentle ramps of walk
 (1) 2 3 4 Non-slip surfaces & railings if needed
- 2 3 4 25. Vehicle disembarking and facility entry ramps
 (1) 2 3 4 On-site bus stops
 (1) 2 3 4 Level platforms/unloading docks
 (1) 2 3 4 Disembarking/unloading convenience
- 2 3 4 26. Site safety-security
 (1) 2 3 4 Lighting adequacy
 (1) 2 3 4 Traffic controls and markings
 (1) 2 3 4 Suitable fences and storage
- 2 3 4 27. Site layout and allocations
 (1) 2 3 4 Instructional area allocations
 (1) 2 3 4 Play-court-athletic allocations
 (1) 2 3 4 Use of areas w/o conflict

Recapitulation of Site AssessmentCOMPONENTSRATING SCALE

		HS	S+	S	S-	US
<u>Acceptability</u>	28- Location for a school site	(1)	2	3	4	5
	29- Health, safety, and security	(1)	2	3	4	5
	30- Compatibility with area	(1)	2	3	4	5
<u>Accessability</u>	31- Convenience to users	(1)	2	3	4	5
	32- Convenience to services and utilities	(1)	2	3	4	5
	33- Traffic patterns and flow	(1)	2	3	4	5
<u>Suitability</u>	34- Site size and shape	(1)	2	3	4	5
	35- Terrain and topography	(1)	2	3	4	5
	36- Distinctive planning possibilities	(1)	2	3	4	5
<u>Development</u>	37- Site surfaces and landscaping	(1)	2	3	4	5
	38- Drives, walks, and parking	(1)	2	3	4	5
	39- Layout and allocations	(1)	2	3	4	5
	40- Site features overall adequacy	(1)	2	3	4	5
<u>Specifications</u>	41- Site improvement overall adequacy	(1)	2	3	4	5

RATING SCALE

HS - Highly Satisfactory (1)

S+ - Satisfactory plus (2)

S - Satisfactory (3)

S- - Satisfactory minus (4)

US - Unsatisfactory (5)

SPATIAL COMPONENT

- 1 2 3 4 42. Availability of appropriate unit areas
 1 2 3 4 Association among units
 1 2 3 4 Design of spaces for special use
 1 2 3 4 Adaptability/modifiability of spaces
- 1 2 3 4 43. Adequacy of unit sizes
 1 2 3 4 Size to shape of spaces
 1 2 3 4 Unobstructed heights of spaces
 1 2 3 4 Instructional to non-instructional areas
- 1 2 3 4 44. Accessibility to related areas
 1 2 3 4 Convenience to personal care areas
 1 2 3 4 Convenience to instructional centers
 1 2 3 4 Convenience to service areas
- 1 2 3 4 45. Movement and natural fit of spaces
 1 2 3 4 Movement within areas
 1 2 3 4 Movement of equipment and materials
 1 2 3 4 Indoor-outdoor arrangements

ACUSTIC COMPONENT

- 1 2 3 4 46. Adequacy of sound-conditioning features
 1 2 3 4 Building envelope treatments
 1 2 3 4 Special acoustical treatments
 1 2 3 4 Unwanted sound restrictions
- 1 2 3 4 47. Quality of hearing environment
 1 2 3 4 Wanted sounds clearly heard
 1 2 3 4 Tolerability levels of sound transmission
 1 2 3 4 Adequacy of sound cushioning and muffling
- 1 2 3 4 48. Adequacy of sound control
 1 2 3 4 Isolation of noise producing activities
 1 2 3 4 Air borne noise tolerability
 1 2 3 4 Structure borne noise tolerability

THERMAL COMPONENT

- 1 2 3 4 49. Thermal adequacy based on need
 1 2 3 4 Heat sufficiency
 1 2 3 4 Ventilation sufficiency
 1 2 3 4 Cooling sufficiency
- 1 2 3 4 50. Regulation for climate control
 1 2 3 4 Ability to change to heat demand
 1 2 3 4 System zoning for partial use
 1 2 3 4 Response of system to outside conditions

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 1 ② 3 4 51. Structural-thermal efficiency
 1 ② 3 4 Design support for thermal efficiency
 ① 2 3 4 Equipment support for thermal efficiency
 1 ② 3 4 Low conductance and high resistance

VISUAL COMPONENT

- ① 2 3 4 52. Adequacy of illumination for visual comfort
 ① 2 3 4 Brightness level
 ① 2 3 4 Ceiling-wall-floor reflection values
 ① 2 3 4 Task control of illumination
 1 ② 3 4 53. Adjustment-regulation for visual control
 1 2 ③ 4 Availability of multiple control switches
 ① 2 3 4 Provision of rheostats where needed
 1 2 3 ④ Regulation of natural light
 ① 2 3 4 54. Flexible and economical light system
 ① 2 3 4 Low brightness of large areas by luminaires
 ① 2 3 4 Lighting responsiveness to space changes
 ① 2 3 4 Energy efficiency of illumination

HYGIENIC COMPONENT

- ① 2 3 4 55. Personal care and conveniences for facility users
 ① 2 3 4 Restrooms conveniently accessible
 ① 2 3 4 Restroom availability for both sexes
 ① 2 3 4 Restroom provisions for handicapped
 ① 2 3 4 56. Design of lavatory-toilet facilities
 ① 2 3 4 Clean and sanitary (w/o odor)
 ① 2 3 4 Use of impervious materials
 ① 2 3 4 Entrance-exit shielding
 ① 2 3 4 57. Availability of special hand washing facilities
 ① 2 3 4 Number of open hand washing facilities
 ① 2 3 4 Placement of open lavatories
 ① 2 3 4 Operable by handicapped
 ① 2 3 4 58. Availability of lockers and shelves
 ① 2 3 4 Space for personal item storage
 ① 2 3 4 Lockers for special clothing storage
 ① 2 3 4 Location/ventilation of lockers

SAFETY COMPONENTS

- ① 2 3 4 59. Precautions for hazards from fumes
 ① 2 3 4 Noxious materials storage
 ① 2 3 4 Hood and shield protection devices
 ① 2 3 4 Devices to handle dangerous materials
 ① 2 3 4 60. Special hazard minimizing equipment
 ① 2 3 4 Explosion proof electrical fixtures
 ① 2 3 4 Special exhaust fans
 ① 2 3 4 Electronic sensors

RATING SCALE

1 - Good
 3 - Poor

2 - Average

123 - Cannot judge or doesn't apply

- 2 3 4 61. Safe movement of people in facility
 (1) 2 3 4 Clear traffic lanes (w/o projections)
 (1) 2 3 4 Traffic lanes lead to foyers and exits
 (1) 2 3 4 V-H traffic flow for handicapped
- 2 3 4 62. Adequacy of fire safety conditions
 (1) 2 3 4 Controls for combustible gases
 (1) 2 3 4 Adequacy of number/types of circuits
 (1) 2 3 4 Storage-disposal of combustibles
- 2 3 4 63. Physical shape of facility for safety
 (1) 2 3 4 Structural soundness for safety
 (1) 2 3 4 Secure-shock proof connections
 (1) 2 3 4 Working condition of operable parts
- 2 3 4 64. Adequacy of safety control equipment
 (1) 2 3 4 Emergency and fire doors
 (1) 2 3 4 Location and marking of extinguishers
 (1) 2 3 4 Adequacy of emergency lighting

TRAFFIC FLOW COMPONENT

- 2 3 4 65. Efficiency of traffic flow in corridors
 (1) 2 3 4 Traffic handling w/o congestion
 (1) 2 3 4 Corridors clearly distinguishable
 (1) 2 3 4 Corridor size for traffic load
- 2 3 4 66. Personnel-equipment movement in corridors
 (1) 2 3 4 Clear of obstructions and projections
 (1) 2 3 4 Non-slip treatment of floors
 (1) 2 3 4 Accommodate movement of handicapped
- 2 3 4 67. Personnel-equipment movement to different levels
 (1) 2 3 4 Handling 2-way traffic on stairs
 (1) 2 3 4 Ramps have gentle slope
 (1) 2 3 4 Elevators for equipment and handicapped
- 2 3 4 68. Adequacy of stair-well features
 (1) 2 3 4 Availability of firm handrails
 (1) 2 3 4 Non-skid surfaces of stairs
 (1) 2 3 4 Nosing-height features of stairs
- 2 3 4 69. Design of vertical movement features
 (1) 2 3 4 Location of stairs to exits
 (1) 2 3 4 Intermittent platforms for stairs
 (1) 2 3 4 Control-safety design of stair wells
- 2 3 4 70. Efficiency of ingress-egress from facility
 (1) 2 3 4 Exit unit width of doors
 (1) 2 3 4 Ease of opening doors
 (1) 2 3 4 Door closure operation
- 2 3 4 71. Adequacy of door features
 (1) 2 3 4 One-level exit platforms
 (1) 2 3 4 Operation of anti-panic hardware
 (1) 2 3 4 Day-night markings of exits

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- ① 2 3 4 72. Efficiency of internal traffic movement
 ① 2 3 4 Traffic changes and dispersals
 ① 2 3 4 Movement within suites and among areas
 ① 2 3 4 Movement of equipment and freight

- ① 2 3 4 73. Efficiency of external traffic movement
 ① 2 3 4 Location of exits for traffic flow
 ① 2 3 4 Crowd movement out of facility
 ① 2 3 4 Dispersals from parking areas

EQUIPMENT COMPONENT

- ① 2 3 4 74. Adequacy of electrical service for task demands
 ① 2 3 4 Meeting power requirements
 ① 2 3 4 Accessibility of power source to equipment
 ① 2 3 4 Dependability/controllability of power
- ① 2 3 4 75. Adequacy of gas service for task demands
 ① 2 3 4 Meeting gas requirements
 ① 2 3 4 Accessibility of gas outlets
 ① 2 3 4 Dependability/controllability of gas service
- ① 2 3 4 76. Adequacy of compressed air for task demands
 ① 2 3 4 Meeting air requirements
 ① 2 3 4 Accessibility of dis-connect outlets
 ① 2 3 4 Dependability/controllability of air service
- ① 2 3 4 77. Adequacy of water service to meet task demands
 ① 2 3 4 Meeting quality-quantity requirements
 ① 2 3 4 Availability of service equipment
 ① 2 3 4 Dependability/controllability of water service
- ① 2 3 4 78. Adequacy of electronic installations for task demands
 ① 2 3 4 Conduit for communication terminals
 1 2 3 ④ AV/TV/computer connections/distributions
 ⑦ 2 3 4 Terminals for clocks/intercoms/telephones
- 1 ② 3 4 79. Adequacy of special equipment needs
 1 2 ③ 4 Special exhaust systems
 1 2 ③ 4 Filtered-humidity controlled air
 ① 2 3 4 Special drainage systems

STRUCTURAL COMPONENT

- ① 2 3 4 80. Adequacy/durability of structural support system
 ① 2 3 4 Weight support/load bearing capacity
 ① 2 3 4 Minimal contraction-expansion problems
 ① 2 3 4 Spanning provides partition flexibility
- ① 2 3 4 81. Adequacy of external wall treatments
 ① 2 3 4 Rigid, safe, and wear resistant
 ① 2 3 4 Control of thermal conductance
 ① 2 3 4 Efficiency for maintenance

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 13/4 - Cannot judge or doesn't apply

- ① 2 3 4 82. Adequacy of internal wall technical qualities
 ① 2 3 4 Partitions tight w/o vibrations
 ① 2 3 4 Tolerability of noise transfer
 ① 2 3 4 Facing and fire-rating quality
- ① 2 3 4 83. Adequacy of interior wall functional qualities
 ① 2 3 4 Reflections complement lighting
 ① 2 3 4 Acoustical properties
 ① 2 3 4 Aesthetics of finishes
- ① 2 3 4 84. Adequacy of ceiling technical qualities
 ① 2 3 4 Strength of suspension w/o air leakage
 ① 2 3 4 Shape support of acoustics
 ① 2 3 4 Ease of repair and maintenance
- ① 2 3 4 85. Adequacy of ceiling functional qualities
 ① 2 3 4 Reflective quality supports lighting
 ① 2 3 4 Absorbent quality supports hearing
 ① 2 3 4 Aesthetic quality
- ① 2 3 4 86. Adequacy of technical floor treatments
 ① 2 3 4 Treatment varies by use
 ① 2 3 4 Wear qualities
 ① 2 3 4 Appropriateness of resiliency
- ① 2 3 4 87. Adequacy of functional floor treatments
 ① 2 3 4 Appearance
 ① 2 3 4 Acoustical quality
 ① 2 3 4 Reflective features
- ① 2 3 4 88. Adequacy of roof and roof deck
 ① 2 3 4 Waterproofness of roofing system
 ① 2 3 4 Handling of roof load
 ① 2 3 4 Span, fire-rating, insulating qualities
- ① 2 3 4 89. Adequacy of foundation support system
 ① 2 3 4 Durability
 ① 2 3 4 Waterproofness
 ① 2 3 4 Appropriateness of insulation
- ① 2 3 4 90. Adequacy of structural envelope
 ① 2 3 4 Fire, wear, weather, and sound properties
 ① 2 3 4 Design, shape, appearance, and materials
 ① 2 3 4 Appropriateness of doors and windows

 RATING SCALE

 1 - Good
 3 - Poor

 2 - Average
 4 - Cannot judge or doesn't apply

Recapitulation of Building Assessment

<u>COMPONENTS</u>		<u>RATING SCALE</u>				
		HS	S+	S	S-	US
<u>Spatial</u>	91- Unit stations and layout	①	2	3	4	5
	92- Unit sizes (l x w x h)	①	2	3	4	5
<u>Sonic</u>	93- Quality of sound	1	②	3	4	5
	94- Noise control	1	②	3	4	5
<u>Thermal</u>	95- Climate control (HVAC)	1	③	③	4	5
	96- Energy sources and efficiency	1	②	3	4	5
<u>Visual</u>	97- Lighting adequacy/controllability	①	2	3	4	5
	98- Visual flexibility/efficiency	①	2	3	4	5
<u>Hygienic</u>	99- Personal care convenience	①	2	3	4	5
	100- Design features support for health	①	2	3	4	5
<u>Safety</u>	101- Hazard controls (fumes, fire, explosion) ...	1	2	③	4	5
	102- Structural-equipment conditions for safety ..	①	2	3	4	5
<u>Traffic-flow</u>	103- Internal movement (H/V people/equipment)	①	2	3	4	5
	104- External movement (people/vehicular)	①	2	3	4	5
<u>Equipment</u>	105- Public utilities and services	①	2	3	4	5
	106- Special equipment installations	①	2	3	4	5
<u>Structural</u>	107- Durability of structural envelope	①	2	3	4	5
	108- Design treatments	①	2	3	4	5
<u>Specifications</u>	109- Construction features overall adequacy	①	2	3	4	5
	110- Education features overall adequacy	①	2	3	4	5

RATING SCALE

HS - Highly Satisfactory (1)
 S+ - Satisfactory plus (2)
 S - Satisfactory (3)
 S- - Satisfactory minus (4)
 US - Unsatisfactory (5)

FANNING/HOWEY ASSOCIATES, INC.

ARCHITECTS • ENGINEERS • CONSULTANTS
CELINA, OHIO • MICHIGAN CITY, INDIANA

July 10, 1978

Dr. Norbert J. Nelson, Professor
Educational Administration,
Curriculum and Supervision
Department of Education
Purdue University
F-15 South Campus Courts
West Lafayette, Indiana 47907

Dear Norb:

I would like to first apologize for the delay in responding to your request of May 12, 1978, in regards to our opinion of your research project "Evaluating and Assessing the Status of Vocational Education Facilities in Indiana"; in particular, the Instruction Manual and School Building/Site Assessment Packet.

I have read through this in some detail in an attempt to try to understand what you wish to achieve through the use of this document. It appears to be a very thorough document which should provide great assistance to the layman in trying to make an evaluation of existing facilities that might be utilized for vocational education purposes.

Although it seems to be quite lengthy, the majority of the information would probably be necessary to properly evaluate the acceptability of an existing facility for the transition to vocational education. Since we know the difficulties involved when technical and professional people such as ourselves evaluate existing facilities in order to better understand their acceptability for different types of functions, we wonder if the document will not get to the point where it is too detailed and too complex for the normal layman to use. I would imagine that, with some education and instruction, this problem could be overcome; and, if I read between the lines correctly, this is probably the intent of the use of this document.

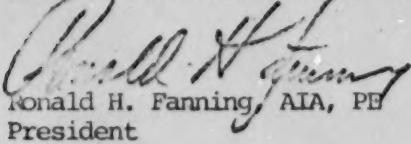
I am sure you have covered the ground sufficiently to provide a useful document which will ensure an appropriate evaluation as to the acceptability of an existing facility for vocational education purposes, if the people using it are properly educated to the extent and need of their research. However, I feel that further action could not be accomplished without professional help; and, here again, this may be what your intent is.

Dr. Norbert J. Nelson
West Lafayette, Indiana
July 10, 1978
Page -2-

If we can be of further help, I would be glad to discuss this with you in more detail, at your convenience.

Sincerely,

FANNING/HOWEY ASSOCIATES, INC.



Ronald H. Fanning, AIA, PE
President

rhf/dm

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May 17, 1978

Dr. Norbert J. Nelson, Professor
Educational Administration,
Curriculum and Supervision
Department of Education
Purdue University
West Lafayette IN 47907

Dear Norb:

I appreciate receiving your letter of May 12, 1978, which included the instruction manual on vocational education facilities. I have several specific comments which I will note to you later.

In general, however, I think this is an excellent manual for a vocational education planning committee. Whether this includes school board members, administrators, teachers, or patrons, is of little difference, in that most individuals are not familiar with the items of consideration when planning such a facility. You have hit the highlights of those items that a committee must be familiar with in order to properly assume a planning role with their architect and engineer.

The following items, I did note, should also be considered:

1. On page 3 - In Marion County, a vocational facility with food service must also be approved by the Marion County Health and Hospital Corporation.
2. On page 6 - Reference should be made somewhere that all facilities must be in compliance with the Uniform Building Code, 1973 Edition, Section 1711.
3. On page 9 - It should be noted that restroom facilities should also be a consideration for the handicapped.

EVERETT · I · BROWN COMPANY

ARCHITECTS & ENGINEERS

Page Two
May 17, 1978

4. On page 21 - The width of the exit doors (includes door from classroom, a shop area to corridor or exterior door) must be 36" in width to meet the requirements of the Uniform Building Code, 1973 Edition, Paragraph 3303B.
5. On page 30, 3rd paragraph - The minimum door width for exiting purposes such as classrooms to corridors should also be 36" and is the same reference as the previous citation.

Norb, I appreciate the opportunity of reviewing this manual. I am sure it will be of value to all concerned.

Sincerely,



Joseph S. Brown

JSB:dr

THE GEUPEL ARCHITECTS AND ENGINEERS, INC.

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June 5, 1978

Dr. Norbert J. Nelson
 Professor Educational Administration
 Curriculum & Supervision
 Purdue University
 F-15 South Campus Courts
 West Lafayette, Indiana 47907

Re: Assessment Document
 Vocational Ed Facilities

Dear Norb:

It was good to hear from you again and to receive your note late last month. I have now had an opportunity to review the vocational educational facilities assessment packet and find it both concise, thorough and comprehensive. In fact, the document could easily be utilized for any kind of a school evaluation program.

One word of caution; it is of course somewhat technical in nature and rather comprehensive in it's evaluation on a room by room basis. More certainly, you will be planning to have some kind of a training program for the personnel to utilize the information in existing building assessment.

I certainly will put my blessing on what has been accomplished here and hope that some time soon we can get together and talk about each other's activities.

As you are aware, I am now associated with The Geupel Architects and Engineers and am very pleased with this new challenge. Although my activities have less emphasis on educational design facilities, I still am keeping my hand in. At present, I am conducting a facility study with our staff for the Washington Township Schools here in Marion County.

When you come to "Indy", why don't you give me a buzz. I have a son now at Purdue and perhaps I will get a chance to contact you there.

Dr. Norbert J. Nelson
Purdue University
June 5, 1978
Page No. 2

If there is any additional way that I can assist you, please
let me know.

Sincerely,

THE GEUPEL ARCHITECTS & ENGINEERS, INC.

Gordon A. Gibbs, AIA

GAG/js

APPENDIX V
INSTRUCTION MANUAL
SCHOOL BUILDING COST ESTIMATION MODEL AND
COMPUTER PROGRAMS FOR VOCATIONAL EDUCATION FACILITIES

INSTRUCTION MANUAL

SCHOOL BUILDING COST ESTIMATION MODEL AND COMPUTER PROGRAMS
FOR
VOCATIONAL EDUCATION FACILITIES

JUNE 1978

PREFACE

The School Building Cost Estimation Model and Computer Programs are a product of the research project "Evaluating and Assessing the Status of Vocational Education Facilities in Indiana," herein referred to as the "Project." This Project was funded through the Indiana State Advisory Council for Vocational Education. The major purpose of the Project was to develop a cost estimation model formula and procedures for estimating the unit cost of renovation of vocational facilities to deliver vocational programs. This model should be applicable to existing facilities as well as to other facilities under consideration for conversion to vocational programs. Another purpose of the Project was to provide computer programs to provide educational planners with summary reports of the data collected.

This manual explains the purpose and procedures used to develop the Cost Estimation Model (CEM). Also, the input, the program, and the output reports developed for the computer program will be discussed. This manual was designed to be used by persons trained in the use of the School Building/Site Assessment Packet. It is necessary that these forms be completed before the data necessary for the CEM or computer programs is prepared.

The manual is designed to provide local and state agencies with useful information to be used in making sound decisions in vocational facility planning. Hopefully, the application of the information contained in this manual will lead to functional facilities in which vocational programs can be conducted at the secondary school level, whether the facility be part of a comprehensive high school, be an area vocational school, or be some other arrangement.

Richard E. Munsterman

INTRODUCTION

There are many reasons for renovating existing vocational facilities and/or converting existing school facilities into vocational-technical program usage. The major reason is changing technology. The power requirements of ten years ago for a vocational shop area do not adequately meet the criteria for today's needs. Size requirements, lighting needs, ceiling height and energy conservation are other reasons for renovation of vocational facilities.

The need for buildings to be accessible to handicapped individuals has made it mandatory that many vocational facilities be modified. Another reason for planning renovation programs for vocational facilities and/or the conversion of regular school buildings to use for vocational programs is the declining enrollment schools are experiencing in Indiana and, indeed, in the entire nation. This has resulted in an excess of buildings in many school districts. At the same time there is an increased emphasis on career and vocational education and thus the corresponding need for adequate facilities.

It was one of the objectives of this Project to determine the feasibility of developing a cost estimation model and procedure which would assist vocational education

planners, architects, and engineers in their planning efforts.

Topics to be discussed in this manual include vocational facilities renovation, cost estimation procedures, cost estimation model, and the computer programs.

VOCATIONAL FACILITY RENOVATION

Renovation of educational facilities is an attempt to bring older facilities up to today's standards and needs. Renovation may be so simple as repainting the walls and ceilings or so extensive as changing major building components--electrical, heating, ventilation, air conditioning (HVAC), plumbing, and general construction. It may also include the addition of more space to meet the requirements of the program.

Before a school facility is renovated, the educational decision makers must answer the following questions in the affirmative.

1. Is the school building under consideration needed in its present location for at least 75 percent of its remaining useful life after modernization?
2. Is it impractical to distribute the pupil load of the school considered for modernization among other nearby adequate schools?
3. Does the structure lend itself to improvement, alteration, remodeling, and expansion?
4. Does the modernization fit into a well-conceived long-range plan?
5. Can the site of the school considered for modernization be expanded to meet minimum standards for the ultimate enrollment envisioned on the site?
- 6 . . . is the annual cost of capital outlay for modernization less than it would be for a replacement building?

7. Has a blue-ribbon committee concluded that educational obsolescence of a given building can be substantially eliminated through the process of modernization?

Any answer to the above questions in the negative generally implies that the educational planners should recommend the construction of a new facility rather than the renovation of an existing facility.

Before any decision is reached on the closing of an existing facility, educational decision makers should review the political climate in the school district against this decision. Many citizens feel that renovation is cheaper than new construction, and they also feel loyalty toward the old facility that served the community in the past. Another area of concern in the closing of a school facility, especially at the secondary level, is the economic impact it will have on the local merchants near the present facility. Not considering the climate in the district against the closing of a facility could possibly result in the citizens preventing the new building from being constructed. Also, with growing inflation in construction, any delay will cost the citizens additional monies for the same facility in the future.

¹Castaldi, Basil. Educational Facilities. Boston: Allyn and Bacon Inc., 1977, pp. 336-339.

Other tasks that educational planners must perform before any renovation or new construction takes place is the development of acceptable educational specifications. Once the facility specifications for the various program areas are developed the educational planners can determine whether or not the existing building can be renovated to these specifications. If not, the decision may then be made to construct a new facility to serve the desired programs. Also, during this time period, it would be economically prudent for a school to hire an educational facilities consultant or an architect to determine the feasibility of any renovation project.

Castaldi has listed some general practical guidelines to consider in renovation projects. These are as follows:

1. The modernized school facility should be equivalent to a new building housing the same educational program.
2. The least costly conversion from one space use to another is one that requires only a change in room label.
3. The conversion of existing large spaces into smaller ones can be financially rewarding.
4. Housing large-space functions in a cluster of small spaces.
5. From the standpoint of cost and structural considerations, the removal of load-bearing partitions should be kept to the absolute minimum.
6. If the modernized building is to be expanded, it might be advantageous to plan large and specialized spaces under the new construction.

¹Ibid., pp. 348-352

COST ESTIMATION PROCEDURES

Estimating the cost of renovation of a vocational-technical educational facility is subject to many factors both tangible and intangible which cause estimation errors. It is estimated by architects that estimation errors of plus or minus 15 percent are not uncommon in the early stages of planning a renovation of an existing facility. Factors that cause this estimating error are as follows:

1. Equipment usage curtailment due to the physical limitation of the project, with only hand-operated equipment being used.
2. Increased requirements for shoring and bracing to hold up the building while structural changes are being made and to allow for temporary storage of construction materials on above-grade floors.
3. Materials handling becomes more costly due to having to move within the confines of an enclosed building. For multi-story construction, low capacity elevators and stairwells may be the only access to the upper floors.
4. Large amounts of cutting and patching and attempting to match the existing construction is required. It is often more economical to remove entire walls rather than cut many new door and window openings.
5. Cost of protection of completed work is increased since the usual sequence of construction usually cannot be accomplished.
6. Economics of scale usually associated with new construction may not be present. If small quantities of components must be custom fabricated due to job requirements, unit costs will naturally increase. Also, if only small work areas are available at a given time, job scheduling between trades becomes difficult and subcontractor quotations may reflect the excessive start-up and shutdown phases of the job.

7. Work may have to be done on other than normal shifts and may have to be done around an existing production facility which has to stay in production during the course of the repair and remodeling.
8. Dust and noise protection of adjoining non-construction areas can involve substantial special protection and alter usual construction methods.
9. Job may be delayed due to unexpected conditions discovered during demolition or removal. These delays ultimately increase construction costs.
10. Piping and ductwork runs may not be as simple as for new construction. Wiring may have to be snaked through walls and floors.

All of the above factors not only make it more difficult to estimate costs of renovation, but they also tend to increase the cost of renovation to higher than new construction costs.

Construction Industry Cost Estimation Methods

Architects and construction estimators use two methods of estimating costs of facility construction. First, during the early stages of facility planning, the square foot costs are used. This is the planning stage in which a schematic drawing of the floor plan is developed and the square foot costs for the various construction components are estimated. It is during this stage that contingency fees of 10 to 15 percent are added to basic construction costs.

¹Godfrey, Robert Sturgis, Ed. Building Construction Cost Data 1977. Duxbury, Mass.: Robert Snow Means Company, Inc., 1976, p. 332.

The following manuals are used by the architects and construction estimators to determine the square foot costs:

Building Construction Cost Data 1978¹

1978 Dodge Construction System Costs²

The manuals provide unit costs for various types of school construction, including vocational schools. Both manuals present construction component costs for low average, average, and high average; the cost per square foot; and the percentage of the total cost. The costs presented do not include architectural fees or land costs. Table 1 is presented to show the construction component costs of an average vocational school adjusted to January 1, 1978.

Table 1 shows that a vocational facility in 1978 on the average should cost \$40.00 per square foot plus \$1.91 per square foot for fixed equipment and \$2.08 per square foot for sitework resulting in an overall construction cost of \$43.99 per square foot. It should be noted that these values are for new construction projects of over \$100,000 and they must be modified for cost of construction in the various areas of the country. Also, adjustments to these

¹Godfrey, Robert Sturgis, Ed. Building Construction Cost Data 1978. Duxbury, Mass: Robert Snow Means Company, Inc., 1977.

²Godfrey, Robert Sturgis, Ed. 1978 Dodge Construction Systems Costs. New York: Dodge Building Cost Services, McGraw-Hill Information Systems Company, 1977.

Table 1. Average Building Costs for a Vocational School.

Building Construction Component	Average	
	\$/Sq. Ft.	%/Total
Foundation	\$ 3.09	7.4
Superstructure	6.90	16.5
Exterior Walls	6.52	15.6
Roofing	1.22	2.9
Partitions	2.78	6.6
Interior Wall Finish	0.94	2.2
Floor Finish	0.74	1.8
Ceilings	0.68	1.6
Specialities	0.94	2.2
Conveying Systems	0.24	0.6
Plumbing	3.54	8.4
Fire Protection	0.30	0.7
HVAC	5.59	13.3
Electrical	3.90	9.3
General Conditions	2.62	6.3
Net Building Cost	40.00	95.4
Equipment	1.91	4.6
Gross Building Cost	41.91	100.0
Sitework	2.08	
Construction Cost	\$43.99	

Source: Godfrey, Robert Sturgis, Ed. 1978 Dodge Construction Systems Costs. New York: Dodge Building Cost Services, McGraw-Hill Information Systems Company, 1977, p. 55

values will be needed based on local construction conditions, code requirements, and the local school district's educational specifications.

The second method of estimating construction costs of school facilities is after the detailed architectural and engineering drawings are developed. The cost estimators then determine the various construction component costs. It is at this stage that contingency costs are estimated at two to seven percent of the total project.

The manuals listed below have been developed to assist cost estimators in preparing their bids.

Building Construction Cost Data 1978¹

1978 Dodge Manual for Building Construction Pricing and Scheduling²

Building Cost File-1977³

The format of these manuals is to provide costs of the various construction components as defined in the Uniform Construction Index.⁴ Cost information is provided on labor,

¹Godfrey, Building Construction Cost Data 1978, 1977.

²Farley, John H., Ed. 1978 Dodge Manual for Building Construction Pricing and Scheduling. New York: Dodge Building Cost Services, Mc-Graw-Hill Information Systems Company, 1977.

³Farley, John H., Ed. Building Cost File, 1977. New York: Construction Publishing Company, Inc., 1976.

⁴Farley, John H., Ed. Uniform Construction Index. Washington: The Construction Specifications Institute, 1972.

materials, and equipment needed to perform given construction tasks such as wiring a wall outlet and installing a toilet. Adjustments to the costs listed in the manual will be necessary due to work force productivity, local building codes, and local construction conditions.

COST ESTIMATION MODEL

The major purpose of the cost estimation model developed for this Project was to determine estimated costs of remodeling, renovation, and/or additional new construction to meet future program needs. Also, the model should be applicable to both existing vocational facilities and to educational and non-educational facilities that educational planners are planning to convert to vocational-technical program usage.

Before an existing structure can be renovated, the present structure must be analyzed for the feasibility of improvement, alteration, remodeling, and expansion. Also, all the major construction components must be compared to some acceptable facility criteria or standard for each program area in question. In addition, some method of inspection needs to be determined in order to accomplish the above tasks.

Acceptable facility criteria for the major construction components were developed by the Project using the national literature survey, the State of Indiana literature survey, and the Modified-Delphi Process. All of the information was reviewed and acceptable facility construction criteria were established for 21 major room types used in vocational-technical programs. Appendix A, Tables A.1 to

A.21 are presented to show the acceptable facility criteria for subcategories of the major construction components and gives the information source for each criteria. The spatial requirements were based upon 20 student stations per room. The information on these tables was then coded for computer usage to be used in making the comparisons against the actual room conditions as found by the site inspectors (see Instruction Manual-School Building/Site Assessment Packet). Details of the computer program and the output forms will be discussed in a later section of this manual.

Cost Estimation Model Development

Based on discussions with architects, Project staff, and other facility planners on the methods they use in early stages of planning renovation of school facilities, the Cost Estimation Model (CEM) was developed.

Background Information

The major information needed for the CEM consists of costs of construction, labor rates, and definition of minor and major renovation.

Construction components were grouped into four major areas:

Plumbing

Heating, ventilation, and air conditioning (HVAC)

Electrical

General

The plumbing components include fire protection by sprinkler systems. Other items included are water systems, bathroom facilities, hot water systems, showers, floor drains, etc. Included in HVAC are the boiler or furnace, ventilation fans, and air conditioning units and all the necessary ductwork, insulation, and controls for proper operation of the system. Electrical components include both interior and exterior lights, electrical distribution systems, switches, wiring, and wall outlets. Also included in this component are the necessary machine control switches and wiring and power requirements of 110, 220, and/or 440 volts.

The general construction component includes foundations, superstructure, exterior walls, roofing, partitions, interior wall finishes, floor finishes, ceilings, specialties, conveying systems, general conditions, and fixed equipment. All of these terms are defined in the Uniform Construction Index¹ manual.

Based upon the cost information provided in Table 1, the following cost estimates for the four major construction components defined in this Project are presented below.

¹Farley, Uniform Construction Index, 1972.

	Minor \$/sq.ft.	Major \$/sq.ft.
Plumbing-includes fire protection	\$ 1.92	\$ 3.84
HVAC	2.80	5.59
Electrical	1.95	3.90
General	9.85	19.71
Total	\$16.52	\$33.04

Minor and major renovation are defined for this Project as shown in Table 2. This table was constructed using the Inspection Form from the School Building/Site Assessment Packet and the Uniform Construction Index Manual. Information in this table includes a listing of construction items for each of the four major construction components and definition of both minor and major renovation for each of these components.

It was determined in discussions with architects that major renovation costs would be the same as new construction for each component for the reasons listed in the section on Cost Estimation Procedures of the manual (Table 1). It was then estimated that minor renovations would be approximately one-half of the major renovation cost.

The general construction component cost was estimated by the following method. One-half of the new construction cost per square foot for foundation (\$3.09), superstructure (\$6.90), exterior walls (\$6.50), and roofing (\$1.22) was determined to be \$8.86 per square foot (1/2 of

Table 2. Definition of Terms on Site Inspectors' Cost Analysis Report.

-
1. **PLUMBING** -- This construction component is concerned with the following items from the School Building Assessment Report and the Inspection Check Sheet:
- a) Wash-up lavatories in all shop areas
 - b) Hot and cold running water and distribution system
 - c) Drinking fountains of proper size and type
 - d) Compressed air service and distribution system
 - e) Welding gas storage and distribution system
 - f) Restrooms equipped for special education students of both sexes
 - g) Special acid resistant fixtures and plumbing where needed
 - h) Garbage disposal units in sinks where needed
 - i) Floor drains of proper type in necessary location
 - j) Tradewaste disposal system
 - k) Sprinkler system

Minor Plumbing Renovation--When the vocational facility or area needs the addition of such items as water outlets, garbage disposal units, drinking fountains, and/or short runs of piping for water, gas, or compressed air distribution systems.

Major Plumbing Renovation--When the vocational facility or area needs complete renovation of washrooms for special education students, additions of wash-up fixtures in all labor shops, sewer additions, air compressors, welding gas storage and distribution systems, pumps, and/or long runs of piping for water, gas, sewage, and/or compressed air distribution systems. The installation of a sprinkler system is part of a major renovation.

2. **HEATING, VENTILATION, AND AIR CONDITION (HVAC)**--This construction component is concerned with the following items from the School Building Assessment Report and the Inspection Check Sheet:
- a) Adequacy of heating system
 - b) Adequacy of ventilation system
 - c) Adequacy of air conditioning (cooling) system, if applicable
 - d) Individual room or area controls for the HVAC system
 - e) Special ventilation hoods for toxic fumes
 - f) Energy conservation controls (night setback)
 - g) Special humidity control system for the computer center

Table 2. Continued.

- h) Special ventilation and air makeup units for spray paint booths
- i) Special separate exhaust systems for sparks and inflammable fumes
- j) Separate ventilation for internal combustion engines (includes diesel engines)
- k) Automotive ventilation system in the greenhouse

Minor HVAC Renovation--When the vocational facility or area needs the addition or renovation of such items as additional ventilation units, special exhaust hoods for dust or toxic fumes, minor changes in HVAC distribution system, and minor HVAC control changes for individual room or area control.

Major HVAC Renovation--When the vocational facility or area needs complete renovation or additions of the complete heating, ventilation, and/or air conditioning system including the control system. This renovation does not include the replacement of the central boiler system, only the changes within the vocational area in question. Other items are the additions of complete special ventilation systems for welding booths with special makeup air units are included in major renovation.

3. ELECTRICAL--The electrical component of construction is concerned with the following items from the School Building Assessment Report and Inspection Sheet:

- a) Adequacy of 110 volt power outlets in walls, ceilings, and/or floors
- b) 220 volt power outlets (single and three phase)
- c) Master control switch for all power except overhead lights in each shop area
- d) 440 volt power outlets for special machines or heating units
- e) Light intensity at desk level adequate (50 cp or above is recommended)
- f) Light intensity in the laboratory areas is adequate (40 cp or above is recommended)
- g) T.V. jacks in all classrooms, laboratories, and shop areas
- h) Phones in all offices
- i) Intercome jacks in all areas (two-way system is recommended)
- j) Emergency panic buttons for all power
- k) Special lighting in dark room with exit door interlocks

Table 2. Continued.

-
- l) Adequate circuit breakers for all electrical power needs
 - m) Overhead busducts in machine shop and welding area. Recommend that 110 volt, 220 volt, and 440 volt overhead ducts be installed for future needs
 - n) Entrance electrical power service is adequate
 - p) Detection systems for fire and burglars

Minor Electrical Renovation--When the vocational facility or area needs the addition or renovation of such items as 110 volt wall outlets, new lighting systems, T.V. jacks, intercome systems, phone, detection systems, for fire and burglars and minor rewiring of machines and equipment.

Major Electrical Renovation--When the vocational facility or area needs complete renovation of the electrical distribution system. This could include new wall outlets, 110 volt, 220 volt, 440 volt busducts, new entry power services, new circuit breakers, installation of panic buttons and explosion proof fixtures. Generally any combination of new lighting, busducts, and entry power service changes in combination with other electrical needs constitute a major electrical renovation.

4. GENERAL--The general construction component is concerned with the physical construction features such as walls, floors, doorways, ramps, floor coverings, etc. Data for this part of the cost analysis is from the Site Assessment Report, the School Building Assessment Report, and the Inspection Check Sheet. The building inspector in determining the renovation of general construction features should be concerned with the following items:

- a) Acoustical treatment of walls, floors, and ceilings in all classrooms and, where necessary, in all shops and laboratory areas
- b) Lighted display window in each program area
- c) Offices with observation windows to oversee all shop and/or laboratory areas
- d) Entry doorways of a minimum of 36 inches in width
- e) Window replacement for energy conservation if needed
- f) Relocating non-load bearing walls
- g) Installation of ramps, rails, landings for handicapped persons

Table 2. Continued.

-
- h) Installation of elevators to multi-story buildings for movement of equipment, supplies, and handicapped person
 - i) Adequate doorways into laboratory or shop areas for entry of equipment or vehicles
 - j) Outside work areas or child development areas are fenced and with adequate surfaces
 - k) X-ray room has lead lined walls
 - l) Dressing rooms, locker areas, or wash-up areas are enclosed and located as needed
 - m) Overhead monorails are located in shop area as needed
 - n) Vehicle wash bay in auto repair area
 - o) Paint spray booths are adequate
 - p) Hydraulic lift for vehicles as needed
 - q) Ceiling heights are adequate for activities in area
 - r) Built-in tie-downs for auto frame alignment in auto body repair area
 - s) Wall, floor, and ceiling surfaces are in good repair and appropriate colors

Minor General Renovation--When the vocational facility or area needs the addition or renovation of such items as walls, floors, or ceilings painted; the addition of acoustical coverings or carpeting; the installation of ramps, railings, and other special facilities for handicapped persons; doorway widening; special equipment for laboratories such as monorails, auto frame alignment tie-downs, and hydraulic hoists; and addition of windows to office area.

Major General Renovation--When the vocational facility or area needs the complete renovation or addition of the majority of the items on the preceding list. Also, the removal and addition or non-load bearing walls, complete window replacement, and the installation of auto paint spray booths. Major general construction renovation does not include any structural changes to the roof, outside walls, or structural columns of the existing building.

\$17.73). Added to this were the total costs per square foot of partitions (\$2.78), interior walls (\$0.94), floor finishes (\$0.74), ceilings (\$0.68), specialities (\$0.94), conveying systems (\$0.24), general conditions (\$2.62) and equipment (\$1.91) which total \$10.85 per square foot. Adding \$8.86 and \$10.85 resulted in the general construction cost of \$19.71 per square foot.

New construction costs per square foot not including sitework from Table 1 are \$41.91. This compares to major renovation costs of \$33.04 or 79 percent of new construction. For minor renovation, \$16.52 is 39 percent of new construction costs.

Another cost adjustment that needs to be considered in the cost model is the Construction Cost Index for various regions in Indiana. Table 3 is presented to show the Construction Cost Index for various cities in Indiana and then corresponding Economic Region. From this table it can be seen that the Construction Cost Index ranges from a low of 93.7 in Fort Wayne to a high of 103.2 in Gary. Thus, a 10,000 square foot building costing \$41.91 per square foot to construct will cost \$392,696 in Fort Wayne and \$433,014 in Gary showing an increased cost of \$40,318 due to using this Index.

If a vocational facility needs additional space, it is necessary to determine a method of estimating this cost. Due to economies of scale and to the high cost of fitting the new structure into the old structure, and adjustment to

Table 3. Construction Cost Index for Cities in Indiana and Corresponding Economic Region.

City	Construction Cost Index	Economic Region
Evansville	96.7	13,14
Fort Wayne	93.7	3,5
Gary	103.2	1
Indianapolis	97.5	4,6,8,9, 11,12
South Bend	96.3	2
Terre Haute	95.5	7,10

Source: Godfrey, Robert Sturgis, Ed. Building Construction Cost Data 1978. Duxbury, Mass: Robert Snow Means Company, Inc., 1977, p. 279.

the new construction cost is needed. It is estimated that if a new construction project is less than 10,000 square feet, the construction cost estimate of \$41.91 would result estimated costs that are too low. An additional 15 percent must be added to cover the cost of adapting the new structure to the old structure. The following decision rules were developed for calculating new construction costs when adding additional space to an existing structure.

1. If the additional square feet needed is less than or equal to 100 square feet for all vocational programs in a facility, no additions would be made.
2. If the additional square feet needed is greater than 100 square feet and less than or equal to 1,000 square feet for all vocational programs in a facility, the cost per square foot will be \$90.10 (41.91×2.15).
3. If the additional square feet needed is greater than 1,00 square feet and less than or equal to 10,000 square feet for all vocational programs in a facility, the cost per square foot will be \$69.15 (41.91×1.65).
4. If the additional square feet needed is greater than 10,000 square feet for all vocational programs in a facility, the cost per square foot will be \$48.19 (41.91×1.15).

The method of determining the additional square feet needed in a facility is done by calculating the difference between the acceptable criteria area (Appendix A) for each room in a vocational cluster and the actual area as determined on the Inspection Form. If the difference between the criteria area and the actual area is positive, this is the additional space requirement needed to bring the room in a vocational program up to minimum criteria. This calculation is performed for every room and every program offered in a vocational-technical facility.

Building Inspector's Cost Analysis Report

Because many school facilities offering vocational programs have been remodeled or expanded while other sections of the same facility have not been, it is necessary to determine the extent of renovation for each program area. Table 4 is presented to show the type of information needed by the building inspector. It is necessary to check the extent of renovation required by each major construction component by program area and to indicate if the area housing the specific program area can be expanded. If the area cannot be expanded, the inspector is to indicate why it cannot be expanded.

Before the building inspector fills out the report, it is necessary that all forms in the School Building/Site Assessment Packet be reviewed. After the review, the inspector then makes the judgment on the degree of

Table 4. Building Inspector's Cost Analysis Report.

Please check the appropriate space under each vocational cluster that best describes the degree of renovation for the facility under study. Please refer to Building Assessment Packet and Inspection Check Sheet for details.

1. Program Area: Agribusiness

Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes ___, No ___

If No, explain: _____

2. Program Area: Business and Office Education

Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes ___, No ___

If No, explain: _____

3. Program Area: Distributive Education

Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes ___, No ___

If No, explain: _____

4. Program Area: Health Occupations

Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes ___, No ___

If No, explain: _____

Table 4. Continued.

5. Program Area: Home Economics Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes __, No __

If No, explain: _____

6. Program Area: Trade and Industrial Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes __, No __

If No, explain: _____

7. Program Area: Special Education - Secondary Vocational Degree of Renovation

Category	None	Minor	Major	Comment
Plumbing				
HVAC				
Electrical				
General				

Can this area be expanded? Yes __, No __

If No, explain: _____

renovation required for each construction component by program area.

The information from the Building Inspector's Cost Analysis Report was coded as input to the computer program for determining the estimated cost of renovation.

Cost Estimation Formula

The following formula was developed to estimate the cost of renovation for a given facility offering vocational-technical programs. The formula is as follows:

$$TC = \left[\left[\sum_{j=1}^7 S_j \times U_j \right] \times CI_m \right] \times 1.10 + \left[\left[\sum_{j=1}^7 D_j \times CS \right] \times CI_m \right] \times 1.10$$

where

- TC = total renovation cost for the facility under analysis
- S_j = the square feet to be renovated for the j^{th} program area. This value includes an adjustment of 20 percent for communication space
- U_j = the renovation cost for the j^{th} program area for the four major construction components (see page)
- CI_m = the Construction Cost Index for the economic region where the facility is located (see Table 3)
- D_j = the total difference for the j^{th} program area between the acceptable criteria area and the actual area
- CS = the new construction cost per square foot based upon the decision rule

The constant 1.10 is an estimate of the contingency cost at the stage of planning

The cost of renovation for all the vocational facilities of an economic region can be calculated by the following formula:

$$EC_r = \sum_{i=1}^n TC_i$$

where

EC_r = the estimated cost of renovation for all facilities within the r^{th} region

TC_i = total renovation cost for the i^{th} facility within the region

The cost of renovation for each program area within an economic region can be calculated by the following formula.

$$VC_{jr} = \left(\left(\sum_{i=1}^n S_{ij} \times U_{ij} \right) \times CI_m \right) \times 1.10 + \left(\left(\sum_{i=1}^n S_{ij} \times CS \right) \times CI_m \right) \times 1.10$$

where

VC_{jr} = the estimated cost of renovation for all facilities in the r^{th} economic region for j^{th} vocational program

S_{ij} = the square feet to be renovated for the i^{th} building and the j^{th} program area. This value includes an adjustment of 20 percent for communication space.

U_{ij} = the renovation cost for the i^{th} building and the j^{th} program area for the four major construction components

CI_m = the Construction Cost Index for the m^{th} economic region

D_{ij} = the total difference for the i^{th} building and the j^{th} program area between acceptable criteria area and the actual area

CS = the new construction cost per square foot based upon the decision rule

The constant 1.10 is an estimate of the contingency cost at the stage of planning

All of the necessary data used to calculate estimated renovation costs are input data to the computer program developed for the Project. Also programmed are all of the above formulas with their corresponding output tables. The computer programs will be discussed in the next section of this report.

The estimated costs for renovation of vocational facilities are not the total costs. Additional monies must be allocated for architectural and/or engineering fees, soil testing, legal fees, and site improvement cost. In addition, if the monies for renovation are borrowed, the interests costs must be included. The architect/engineering fees can range from approximately 11 percent on a \$50,000 project to 6 percent on a \$10,000,000 project. For a renovation project costing \$500,000 based upon the cost estimating formula, it is necessary to add another 10 percent or more into this cost to determine total costs in addition to any interest charges.

COMPUTER PROGRAM

Providing data on the status of vocational facilities in Indiana was the major purpose of this Project. Computers are a necessary tool for processing the large amounts of data from the School Building/Site Assessment Packet and from the Building Inspector's Cost Analysis Report into meaningful management reports. In this section of this manual the coding instructions, the computer programs, and the output reports will be discussed.

Coding Instructions

The first step in preparing the data for use by the computer is to determine what data will be used and the method used to code the information for computer usage. Appendix B, Table B.1 is shown to present the instructions to the person coding the data from the School Building/Site Assessment Packet and the Building Inspector's Cost Analysis Report. Information presented in this table includes the item number or name from the inspection packet and report, the coding instructions, the card number, and the field location on the card. By following these instructions, a person will be able to prepare the coding sheets for the keypunch operator who will prepared the data cards or tape.

It should be noted that all the data collected in the School Building/Site Assessment Packet is not coded.

The reason for this is that a great deal of the Site and Building Assessment forms are for the site inspector's benefit in that they help this person in judging the adequacy of the facility. Other data collected applies only to the facility in question and can be studied by looking at the original data collection forms. Also, the decision was made to include only the data from these forms that were necessary for making comparisons of actual facility characteristics against acceptable criteria, that were necessary for determining estimated renovation costs, and that would be useful in making summary reports.

Computer Program Description

Two major computer programs were developed for this Project. The first program is written in FORTRAN IV-G which will generate the following output.

1. Comparisons of acceptable facility criteria vs. actual condition as reported on the Inspection Form
2. Estimated costs of renovation and new additions by program area for each building
3. Total estimated costs of renovation and new additions by program area by economic region
4. Average actual area by program area for all buildings in sample.

This program is designed to be operated on the State of Indiana's computer. The program was developed and tested at the Purdue University Computer Center. Input to the computer program is by 80 column card format or its equivalent and the output is designed for standard computer output paper. Operation of the program is batch loading. As new facilities are inspected and prepared for analysis, it is necessary to run all previous facilities to generate new updated summary reports. The program was designed for this manner of operation to save on computer core requirement. It was determined that the program would not be an on-line operation, but that it would be operated approximately six times per year at the most.

Due to the changing costs of construction due to inflation, the changing Construction Cost Index, and the changing criteria for vocational facilities, it will be necessary to update the program on a yearly basis as a minimum requirement. Included in Appendix C are the detailed instructions for this program and the computer listing of the program. Additional documentation for the program is provided in the comment cards on the program listing.

The second program developed for the Project is SPSS (Statistical Package for the Social Sciences) program that will provide summary tables of descriptive statistics for items 28 through 41 of the Site Assessment and items 91 through 110 of the Building Assessment from the School Building/Site Assessment Packet. SPSS is a general

multi-purpose programming system for analysis of questionnaire type data. This program is designed to operate on the State of Indiana's computer, and it was tested and run at the Purdue University Computer Center. Appendix C contains the program listing and detailed instructions for operation.

Output Reports from Computer Programs

For each output report developed by the computer program, the discussion of each report will include an example, the purpose, and its anticipated use for decision making.

The first output report is the report which compares each room or area of a facility against the acceptable criteria as developed by the Project (see Appendix A). Table 5 is an example of such a comparison. From this table, educational planners are able to determine which rooms or areas within a building are meeting or not meeting criteria for the listed construction component. This report would be useful for comparing proposed vocational facilities to see if they meet the acceptable criteria.

Table 6 is presented to show the estimated costs of renovation and new addition by vocational program areas. These costs are for only the vocational program areas of a facility offering vocational education and does not include other instructional areas of the facility. In order to understand the full meaning of these costs, the educational

Table 5. Computer Printout--Comparison of Room or Area of Facility Against Acceptable Criteria Developed by Project.

COMPARISON OF ACCEPTABLE FACILITY CRITERIA VS. ACTUAL CONDITIONS FOR INSTRUCTIONAL CLASSROOM AT			
CATEGORY	ACCEPTABLE CRITERIA	ACTUAL CONDITIONS	MEETS CRITERIA.
SPATIAL FEATURES			
SIZE-AREA-SQ FT	825	1058	YES
CEILING HEIGHT-FT	9	10	YES
STORAGE AREA-SQ FT	NA	-0	NA
CONSTRUCTION FEATURES			
INTERIOR TREATMENTS			
FLOOR	CERAMIC OR TILE	NON-SLIP CONCRETE OR WOOD	NO
WALLS	ACOUSTICAL	SCRUBBABLE	NO
CEILING	ACOUSTICAL TILE	ACOUSTICAL TILE	YES
DOORS			
OVERHEAD WIDTH-FT	NA	-0	NA
OVERHEAD HEIGHT-FT	NA	-0	NA
EXTERIOR WIDTH-INCHES	36	36	YES
INTERIOR WIDTH-INCHES	36	36	YES
ELECTRICAL FEATURES			
POWER			
WALL OUTLETS			
NUMBER	17 (1 PER 4 FT)	10	NO
VOLTAGE	110	110	YES
MACHINE OUTLETS			
SERVICE	NA	NONE	NA
VOLTAGE	NA		NA
OUTSIDE OUTLETS	NA	NO	NA
MASTER CONTROL	NA	NO	NA
PANIC BUTTON	NA	NO	NA
ELECTRONIC FEATURES			
INTERCOM	NO	TWO-WAY	NO
TELEPHONE SERVICE	NO	NO	YES
TV SERVICE	NO	YES	NO
ELECTRONIC SENSORS	NO	NO	NO
MECHANICAL FEATURES			
HVAC SYSTEM			
HVAC STATION REGULATION	YES	NO	NO
AIR CONDITIONED	YES	YES	YES
PLUMBING SERVICE			
WATER SERVICE	YES	HOT + COLD	YES
DRINKING FOUNTAIN	NA	YES	NA
LAVATORY	YES	YES	YES
FLOOR DRAINS	NA	NO	NA
OUTSIDE WATER SERVICE	NA	NO	NA
GAS SERVICE			
AVAILABILITY	NA	NO	NA
MASTER CONTROL	NA	NO	NA
COMPRESSED AIR SERVICE			

Table 5. Continued.

AVAILABILITY	NA	NO	NA
OUTSIDE AIR SERVICE	NA	NO	NA
HEALTH AND SAFETY FEATURES			
HEALTH			
CONVENIENT RESTROOM	NA	YES	NA
LOCKERS AVAILABLE	NA	YES	NA
DUST-FUME REMOVAL	NA	NO	NA
SPECIAL VENTILATION	YES	NO	NO
SAFETY			
FIRE EXTINGUISHER	YES	YES	YES
SPRINKLER SYSTEM	YES	NO	NO
ALARM SYSTEM	YES	YES	YES
GOOD SECURITY	YES	YES	YES
BARRIER-FREE FEATURES			
SPECIAL EQUIPMENT	YES	NO	NO
ADEQUATE ENTRANCES-EXITS	YES	NO	NO
ADEQUATE H-V MOVEMENT	YES	YES	YES

*****NOTE: NA = NOT APPLICABLE
NC = NO CRITERIA

Table 6. Computer Printout--Estimated Costs of Renovation and New Addition by Vocational Program Areas.

ESTIMATED COSTS OF RENOVATION BY PROGRAM AREA AND NEW ADDITIONS FOR	
AREA	ESTIMATED COST IN DOLLARS
AGRI-BUSINESS	42476.
BUSINESS AND OFFICE EDUCATION	0
DISTRIBUTIVE EDUCATION	0
HEALTH OCCUPATIONS EDUCATION	0
HOME ECONOMICS EDUCATION	60614.
TRADE AND INDUSTRIAL EDUCATION	0
SPECIAL EDUCATION - SECONDARY VOCATIONAL	0
NEW CONSTRUCTION FOR ALL PROGRAM AREAS	242313.

TOTAL COST	345403.

planner must review the School Building/Site Assessment Packet and the Building Inspector's Cost Analysis Report. After reviewing these costs and answering the renovation questions presented by Castaldi (pages 239-240), a decision is then made on the need to renovate or the need to start planning for new facilities to offer vocational programs.

Table 7 is an example of the summary table which shows the cost of renovation for all program areas by economic region. The present table includes only those facilities that were inspected by the Project. Information this table is useful for state decision makers in allocating construction approval or funds for vocational facilities. Also, the table is useful for showing the need for additional funds from state or federal leaders to meet the need for additional facilities in order to deliver the necessary programs to each of these areas.

Table 8 is presented to show a summary of the average actual area (square feet) of the facilities in the sample for each program area. Information from this table is used to assess the present status of vocational facilities by program area.

This information is useful in comparing the acceptable criteria or state standards against actual condition. Educational decision makers using information from this table can determine the need for new facilities, a realistic appraisal of acceptable criteria in view of

Table 7. Computer Printout--Summary Table Showing Cost of Renovation for All Program Areas by Economic Region.

TOTAL ESTIMATED COSTS OF RENOVATION BY PROGRAM AREA AND NEW ADDITIONS BY ECONOMIC REGION														
AREA.	ECONOMIC REGION													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0	71535.	0	0	46375.	65513.	0	234861.	0	0	0	0	0	0
2	0	0	0	21253.	34938.	0	0	293080.	0	0	0	0	0	0
3	0	0	0	0	27066.	0	0	110861.	0	0	0	0	0	0
4	0	0	0	0	76892.	0	0	113493.	0	0	0	0	0	0
5	0	127426.	0	61396.	95748.	48779.	0	229398.	0	0	0	0	0	0
6	0	0	0	0	359424.	0	0	153184.	0	0	0	0	0	0
7	0	0	0	0	0	0	0	24164.	0	0	0	0	0	0
NEW	0	493489.	0	136683.	563270.	305998.	0	1070113.	0	0	0	0	0	0
TOTAL	0	692450.	0	219331.	1203703.	420290.	0	2229154.	0	0	0	0	0	0
	(N= 0)	(N= 2)	(N= 0)	(N= 1)	(N= 3)	(N= 1)	(N= 0)	(N= 9)	(N= 0)	(N= 0)	(N= 1)	(N= 0)	(N= 0)	(N= 0)

NOTE: PROGRAM AREA NUMBERS ARE AS FOLLOWS

- 1 AGRIBUSINESS
- 2 BUSINESS AND OFFICE EDUCATION
- 3 DISTRIBUTIVE EDUCATION
- 4 HEALTH OCCUPATIONS EDUCATION
- 5 HOME ECONOMICS EDUCATION
- 6 TRADE AND INDUSTRIAL EDUCATION
- 7 SPECIAL EDUCATION - SECONDARY VOCATIONAL

Table 8. Summary of Average Actual Area of Facilities
in the Sample for Each Program Area.

AVERAGE ACTUAL AREA (SQ FT) BY PROGRAM AREA FOR BUILDINGS IN SAMPLE		
AREA	AVERAGE	N
AGRIBUSINESS EDUCATION	3456.	7
BUSINESS AND OFFICE EDUCATION	1654.	9
DISTRIBUTIVE EDUCATION	1515.	5
HEALTH OCCUPATIONS EDUCATION	2770.	4
HOME ECONOMICS EDUCATION	3500.	7
TRADE AND INDUSTRIAL EDUCATION	11830.	2
SPECIAL EDUCATION-SECONDARY VOCATIONAL	684.	1

existing facilities for offering these programs, and the establishment of guidelines for program approval based on these actual conditions.

An example of the output tables from the SPSS program is shown in Table 9. Tables of this type are useful in determining the quality of the site and facilities. Data from each question of the site and building recapitulation from the School Building/Site Assessment Packet is presented in a separate table. Interpretation of these tables shows the number of facilities and the rating by the inspector on a scale of highly satisfactory (HS) to unsatisfactory (US). Percentage values are presented for each building within each economic region. Analysis of these tables, when combined with the cost estimate for renovation by economic region (Table 7), provide educational planners additional information on the need for renovation of existing vocational facilities in various areas of the state.

Table 9. Example Output Table for Determining Quality of the Site and Facilities.

STATUS OF VOCATIONAL EDUCATION FACILITIES BY ECONOMIC REGION									
07/15/78. 11.48.15. PAGE 10									
LE NONAME (CREATION DATE = 07/15/78.)									
CHUS STARULATION OF									
1102 SUTABLE SITE SIZE AND SHAPE BY ECREG ECONOMIC REGION									
PAGE 1 OF 1									
ECREG									
COUNT	1	2	3	4	5	6	7	8	9
COL PCT	1	2	3	4	5	6	7	8	9
TOT PCT	1	2	3	4	5	6	7	8	9
ROW TOTAL	1	2	3	4	5	6	7	8	9
HIGHLY SATIS.	1	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0
SATIS. PLUS	2	0	100.0	0	0	0	0	11.1	12.5
	0	0	6.3	0	0	0	0	6.3	0
SATISFACTORY	3	2	0	0	0	1	7	12	75.0
	100.0	0	0	0	0	100.0	77.8	75.0	0
	12.5	0	0	12.5	0	6.3	43.8	0	0
SATIS. MINUS	4	0	0	0	0	0	1	6.3	0
	0	0	0	0	0	0	11.1	6.3	0
	0	0	0	0	0	0	6.3	0	0
COLUMN TOTAL	2	1	3	1	9	10	0	0	0
TOTAL	12.5	6.3	10.0	8.3	56.3	100.0	0	0	0

SUMMARY OF PROCEDURES TO USE WITH
COST ESTIMATION MODEL AND COMPUTER PROGRAMS

In order to use the Cost Estimation Model developed in the manual, it is necessary to follow the following steps:

1. Complete all forms of the School Building/Site Assessment Packet.
2. Complete the Building Inspector's Cost Analysis Report.
3. Code the data as per instructions on the Coding Instructions.
4. Key punch and verify the data input.
5. Run the computer programs.
6. Analyze the output reports for errors.
7. Compare the output reports with inspection forms for consistency.
8. Correct all errors and inconsistent results.
9. Submit results to proper persons for decision making.

By following these nine steps, the researcher can insure that the information presented in reports to educational decision makers will be accurate and consistent.

The value of this information is enhanced if the reported data can be verified when compared against the actual conditions.

APPENDIX A

APPENDIX A. ACCEPTABLE CRITERIA DATA

Table A.1. Acceptable Facility Criteria for a Classroom in a Vocational-Technical Education Program.

Code: Room Type 11

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	825	1
Ceiling height-feet	9	2
Storage Area-square feet	N/A	
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Tile	
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	N/A	
-floor	N/A	
Voltage	N/A	
Outside outlets	N/A	
Master control	N/A	
Panic button	N/A	
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	N/A	
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.1. Continued

Code: Room Type 01

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	N/A	
Lockers available	N/A	
Dust-fume removal	N/A	
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.2. Acceptable Facility Criteria for a Dental Occupation Laboratory in a Health Occupation Program.

Code: Room Type 03

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	1300 incl.util.work area & locker area	1
Ceiling height-feet	8	2
Storage Area-square feet	300	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Non-slip surface	4
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1-every 8 ft. of linear wall	1
Voltage	110	1
Machine outlets		
Service-ceiling	N/C	
-floor	N/C	
Voltage	N/C	
Outside outlets	N/C	
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	N/A	

Table A.2. Continued.

Code: Room Type 03

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	Yes	1
Master Control	Yes	1
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	N/A	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.3. Acceptable Facility Criteria for a Medical Laboratory in a Health Occupation Program.

Code: Room Type 04

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	1550 includes locker and lavatory	1
Ceiling height-feet	8	2
Storage Area-square feet	200	1
CONSTRUCTION FEATURES		
Treatments (interior)		
Floor	Non-slip	4
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
Doors		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
Power		
Wall outlets		
Number	1 each work station; 1-8' spacing	1
Voltage	110	1
Machine outlets		
Service-ceiling	N/C	
-floor	N/C	
Voltage	N/C	
Outside outlets	N/C	
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	N/C	
Electronic sensors	Yes	1
MECHANICAL FEATURES		
HVAC Systems		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
Plumbing Service		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	N/A	

Table A.3. Continued.

Code: Room Type 03

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	Yes	1
Master Control	Yes	1
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	N/A	
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	1
Alarm systems	Yes	1
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.4. Acceptable Facility Criteria for a Care and Guidance of Children's Laboratory in Home Economics Education Program.

Code: Room Type 05

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
<u>Size</u> -Area-square feet	1700 includes play area, toilet, isolation and observation	1
<u>Ceiling</u> height-feet	9	2
<u>Storage Area</u> -square feet	250	1
CONSTRUCTION FEATURES		
<u>Treatments</u> (interior)		
Floor	Carpet	2
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	72	2
Interior-width inches	72	2
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 ft of linear wall area	2
Voltage	110	2
Machine outlets	N/C	
Service-ceiling	N/C	
-floor	N/C	
Voltage	N/C	
Outside outlets	N/C	
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.4. Continued.

Code: Room Type 05

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service		
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.5. Acceptable Facility Criteria for a Food Management, Production and Services Laboratory in a Home Economics Education Program.

Code: Room Type 06

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	2250 includes dining and locker area	1
Ceiling height-feet	9	2
Storage Area-square feet	600 includes dry, refrigerated, and cleaning areas	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Carpeting and nonslip surfaces	1
Wall	Acoustically treated	1
Ceiling	Acoustically treated	1
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	72	2
Interior-width inches	72	2
ELECTRICAL FEATURES		
<u>Power</u>		
<u>Wall outlets</u>		
Number	1-each sta., 1-8' for linear wall	1
Voltage	110	1
Machine outlets	Yes	1
<u>Service-ceiling</u>		
-floor	N/C	
Voltage	220	1
Outside outlets	Yes	1
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	1
Air Conditioned	N/C	
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A.5. Continued.

Code: Room Type 06

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		1
Availability	Yes	1
Master Control	Yes	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		1
Convenient restrooms	Yes	
Lockers available	N/C	
Dust-fume removal	N/C	
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.6. Acceptable Facility Criteria for a Clothing Management, Production, and Services Laboratory in a Home Economics Education Program.

Code: Room Type 07

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	1600 includes fitting room	1
Ceiling height-feet	9	2
Storage Area-square feet	200	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Carpeting	2
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	72	2
Interior-width inches	72	2
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets	Yes	1
Number	1-every 8 ft. of linear wall	1
Voltage	110	1
Machine outlets	Yes	1
Service-ceiling	N/C	
-floor	Yes	1
Voltage	110	1
Outside outlets	N/C	
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	N/C	
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.6. Continued.

Code: Room Type 07

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	N/A	
Special ventilation	N/A	
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	4
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.7. Acceptable Facility Criteria for a General Intensive Office Laboratory Instruction Area in a Business and Office Education Program.

Code: Room Type 08

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	1500 includes recep. & duplication areas	1
Ceiling height-feet	9	2
Storage Area-square feet	150	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Carpeted	1
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	15	1
Voltage	110	1
Machine outlets		
Service-ceiling	N/A	
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets	N/A	
Master control	Yes	1
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	Yes	1
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A7. Continued.

Code: Room Type 08

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	4
Lockers available	Yes	4
Dust-fume removal	N/A	
Special ventilation	Yes	4
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.8. Acceptable Facility Criteria for a Cooperative Office Education Instruction Area in a Business and Office Education Program.

Code: Room Type 09

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	1150 includes office space	1
Ceiling height-feet	9	2
Storage Area-square feet	150	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Carpeting	1
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	15	1
Voltage	110	1
Machine outlets		
Service-ceiling		
-floor	Yes	1
Voltage	110	1
Outside outlets	N/A	
Master control	Yes	1
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	Yes	1
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.8. Continued

Code: Room Type 09

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	4
Lockers available	Yes	4
Dust-fume removal	N/A	
Special ventilation	N/A	
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.9. Acceptable Facility Criteria for a Data Processing Instructional Area in a Business and Office Education Program.

Code: Room Type 10

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
<u>Size-Area-square feet</u>	2370 includes computer facility data entry facility and general area	1
<u>Ceiling height-feet</u>	9	2
<u>Storage Area-square feet</u>	300 includes teacher area storage	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Carpeting	1
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	72-equipment entrance	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	1
Voltage	110	1
Machine outlets		
Service-ceiling		
-floor	Yes	1
Voltage	110	1
Outside outlets	N/A	
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	1
Air Conditioned	Yes	1
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.9. Continued.

Code: Room Type 10

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	4
Lockers available	Yes	4
Dust-fume removal	N/A	
Special ventilation	N/A	
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.10. Acceptable Facility Criteria for a Distributive Education Laboratory in a Distributive Education Program.

Code: Room Type 11

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	1700 includes classroom and lab. area	1
Ceiling height-feet	9	2
Storage Area-square feet	350	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Carpeting	1
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 ft. of linear wall	1
Voltage	110	1
Machine outlets	Yes	2
Service-ceiling	Yes	1
-floor	110 and 220	2
Voltage		
Outside outlets	N/A	
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	Yes	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	N/A	

Table A.10. Continued.

Code: Room Type 11

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/A	
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	4
Lockers available	Yes	4
Dust-fume removal	N/A	
Special ventilation	Yes-for signmaking equipment	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.11. Acceptable Facility Criteria for an Auto Body and Fender Area in a Trade and Industrial Education Program.

Code: Room Type 12

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	3300	1
Ceiling height-feet	10-12 below lights minimum	1
Storage Area-square feet	300	
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete nonslip	1
Wall	Scrubbable surface-paint or tile	1
Ceiling	Acoustically treated	1
<u>Doors</u>		
Overhead-width feet	10	1
height feet	12	2
Exterior-width inches	60	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets	Yes	1
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/A	
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	1
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A.11. Continued.

Code: Room Type 12

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.12. Acceptable Facility Criteria for an Auto Mechanics Area in a Trade and Industrial Education Program.

Code: Room Type 13

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	4100	1
Ceiling height-feet	15	1
Storage Area-square feet	400 storage and tool crib	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete-nonslip surface	1
Wall	Scrubbaable surface-paint or tile	1
Ceiling	Acoustically treated	1
<u>Doors</u>		
Overhead-width feet	12	2
height feet	12	2
Exterior-width inches	60	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	
Machine outlets		
Service-ceiling	Yes	2
-floor	Yes	2
Voltage	110 and 220	1
Outside outlets	Yes	2
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	N/C	
Electronic sensors	N/c	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	N/A	
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A.12. Continued.

Code: Room Type 13

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.13. Acceptable Facility Criteria for a Drafting Area in a Trade and Industrial Education Program.

Code: Room Type 14

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	2000	1
Ceiling height-feet	9	2
Storage Area-square feet	200	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	N/C	
Wall	Acoustically treated	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	48	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	2
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets		
Master control	Yes	2
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	N/C	
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.13. Continued.

Code: Room Type 14

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.14. Acceptable Facility Criteria for a Machine Trades Area in a Trade and Industrial Education Program

Code: Room Type 15

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
<u>Size</u> -Area-square feet	4700	1
Ceiling height-feet	12	2
<u>Storage Area</u> -square feet	400	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete-nonslip	2
Wall	Scrubable surface-paint or tile	1
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	12	2
height feet	12	2
Exterior-width inches	60	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110, 220, and 440	1
Outside outlets	Yes	2
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	1
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A.14. Continued.

Code: Room Type 15

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	Yes	1
Master Control	Yes	1
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.15. Acceptable Facility Criteria for a Printing Area in a Trade and Industrial Education Program.

Code: Room Type 16

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	2400 includes darkroom	1
Ceiling height-feet	9	2
Storage Area-square feet	600	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete - nonslip	1
Wall	Scrubable surface-paint or tile	2
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/C	
height feet	N/C	
Exterior-width inches	48	2
Interior-width inches	36	1
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets	N/A	
Master control	Yes	1
Panic button	Yes	2
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Nes	1
Outside water service	N/A	

Code: Room Type 16

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.16. Acceptable Facility Criteria for a Radio and TV Repair Area in a Trade and Industrial Education Program.

Code: Room Type 17

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	2000	1
Ceiling height-feet	9	2
Storage Area-square feet	300	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete - nonslip	1
Wall	Scrubable surface-paint or tile	1
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	N/A	
height feet	N/A	
Exterior-width inches	48	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets	N/A	
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	Yes	1
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	N/A	
Outside water service	N/A	

Table A.16. Continued.

Code: Room Type 17

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	N/A	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
 N/C, no criteria established

Table A.17. Acceptable Facility Criteria for a Welding Area in a Trade and Industrial Education Program.

Code: Room Type 18

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	4000	1
Ceiling height-feet	14	2
Storage Area-square feet	200	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Metal "x" grating or concrete	1
Wall	Scrubbable surface-Paint or tile	1
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	12	2
height feet	12	2
Exterior-width inches	60	2
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110, 220, and 440	1
Outside outlets	Yes	1
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A.17. Continued.

Code: Room Type 18

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	Yes	1
Master Control	Yes	1
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.18. Acceptable Facility Criteria for an Agriculture Production or Sales and Science/Products Area in an Agribusiness Education Program.
Code: Room Type 19

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
<u>Size</u> -Area-square feet	2400	1
Ceiling height-feet	12	2
<u>Storage Area</u> -square feet	400	1
CONSTRUCTION FEATURES		
<u>Treatments</u> (interior)		
Floor	Concrete or wood--nonslip	2
Wall	Scrubable surface-paint or tile	1
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	12	2
height feet	12	2
Exterior-width inches	N/C	
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets	Yes	1
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	1
T.V. Service	Yes	2
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A18. Continued.

Code: Room Type 19

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.19. Acceptable Facility Criteria for an Agriculture Mechanics Area in an Agribusiness Education Program.

Code: Room Type 20

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	3000 includes spray paint area	1
Ceiling height-feet	12	2
Storage Area-square feet	400	1
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete, wood, non-slip	2
Wall	Scrubable surface--paint or tile	1
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	14	1
height feet	16	2
Exterior-width inches		
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	1
-floor	Yes	1
Voltage	110 and 220	1
Outside outlets	Yes	1
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	No	2
T.V. Service	Yes	2
Electronic-sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	2
Air Conditioned	No	2
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A. 19. Continued.

Code: Room Type 20

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	Yes	1
Outside air service	Yes	1
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire extinguisher	Yes	1
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.20. Acceptable Facility Criteria for a Comprehensive Ornamental Horticulture Area in an Agribusiness Education Program.

Code: Room Type 21

Category	Acceptable Criteria	Source of Criteria
SPATIAL FEATURES		
Size-Area-square feet	3200 includes laboratory and greenhouse	1
Ceiling height-feet	10	2
Storage Area-square feet	300	2
CONSTRUCTION FEATURES		
<u>Treatments (interior)</u>		
Floor	Concrete - nonslip	1
Wall	Scrubable surface--paint or tile	1
Ceiling	Acoustically treated	2
<u>Doors</u>		
Overhead-width feet	10	1
height feet	10	1
Exterior-width inches	36	3
Interior-width inches	36	3
ELECTRICAL FEATURES		
<u>Power</u>		
Wall outlets		
Number	1 every 8 feet of linear wall	2
Voltage	110	1
Machine outlets		
Service-ceiling	Yes	2
-floor	N/C	
Voltage	110 and 220	1
Outside outlets	Yes	1
Master control	Yes	1
Panic button	Yes	1
ELECTRONIC FEATURES		
Intercom	N/C	
Telephone Service	N/C	
T.V. Service	N/C	
Electronic sensors	N/C	
MECHANICAL FEATURES		
<u>HVAC Systems</u>		
Station regulation-HVAC	Yes	1
Air Conditioned	N/A	
<u>Plumbing Service</u>		
Water Service	Yes	1
Drinking Fountain	Yes	1
Lavatory	Yes	1
Floor Drains	Yes	1
Outside water service	Yes	1

Table A.20. Continued.

Code: Room Type 21

Category	Acceptable Criteria	Source of Criteria
MECHANICAL FEATURES (continued)		
<u>Gas Service</u>		
Availability	N/A	
Master Control	N/A	
<u>Compressed Air Service</u>		
Availability	N/C	
Outside air service	N/C	
HEALTH AND SAFETY FEATURES		
<u>Health</u>		
Convenient restrooms	Yes	1
Lockers available	Yes	1
Dust-fume removal	Yes	1
Special ventilation	Yes	1
<u>Safety</u>		
Fire ext. quisher	Yes	4
Sprinkler system	Yes	5
Alarm systems	Yes	4
Good security	Yes	4
BARRIER FREE FEATURES		
Special equipment	Yes	3
Adequate entrance/exits	Yes	3
Adequate H-V movement	Yes	3

Note:--N/A, does not apply to this area
N/C, no criteria established

Table A.21. Sources of Criteria for Tables A.1 through A.20.

1. Functional Space Planning Guide for Vocational-Technical Programs in Secondary Schools. Department of Public Instruction, Division of Vocational Education, State of Indiana.
 2. Delphi Study from the research project "Evaluation and Assessing the Status of Vocational Educational Facilities in Indiana."
 3. American National Standards Institutes Publication (ANSI A117.1-1961, R1971).
 4. School Construction Rules and Regulation, Volume V, 1967. Administrative Building, Council of Indiana.
 5. Indiana State Fire Marshall's Office.
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APPENDIX B

APPENDIX B³
CODING INSTRUCTIONS

Table B.1. Coding Instructions.

Item	Instruction	Card No.	Field
General Data Form			
Institution ID No.	4-digit code 0001-9999	1	1-4
Bldg./Site No.	4-digit code 0001-9999		5-8
County	2-digit code 01-99		9-10
Economic Region	2-digit code 01-99		11-12
Other	4-digit code 0001-9999 (to be used for special identification of facility if needed)		13-16
Institution or Bldg. Name	Alpha up to 20 spaces		17-36
No. of Program Areas in Building	Record the number of Inspection Forms in Inspection Report		37
Card Number	In column 80 of first card record "1"		80

Information Note

Repeat the following card for every program area within the building. For example, if there are two program areas, the card will need to appear twice in the deck. The second card will appear after the room data cards for the first program area.

Bldg./Site No.	4-digit code-This number is the same as column 5-8 of card one (1)	2	1-4
Program Area	Record 1-7 1. Agribusiness 2. Business and Office Education 3. Distributive Education 4. Health Occupation 5. Home Economics 6. Trade and Industrial 7. Special Education-S Secondary Vocation		5
Rooms in Program Area	Indicate the number of rooms or work areas (this will be the number of columns on the Inspection Form completed) 0-5. Include dummy office and classroom cards if needed. Record two or the appropriate number to maintain sequence		6 80

Table B.1. Continued.

Item	Instruction	Card No.	Field
***** Information Note ***** The following coding instructions will be repeated for each room or work area within the program area. For dummy office or classroom cards only record information up to column 8.			
Bldg./Site No.	4-digit code-This number is the same as 5-8 of card one (1)	3	1-4
Inspection Form			
Number of Student Stations	Record actual number 00-99		5-6
Type of Room	Record 01-21 as per list		7-8
	01-Classroom		
	02-Teacher Office		
	03-Dental Laboratory		
	04-Medical Laboratory		
	05-Care and Guidance of Children Laboratory		
	06-Food Management Laboratory		
	07-Clothing Laboratory		
	08-Office Laboratory		
	09-Cooperative Office Instructional Area-Including Office		
	10-Data Processing Instructional Area		
	11-Distributive Education Laboratory-Includes classroom		
	12-Auto Body and Fender Area		
	13-Auto Mechanics Area		
	14-Drafting Area		
	15-Machine Trades Area		
	16-Printing Area-Includes darkroom		
	17-Radio-TV Repair Area		
	18-Welding Area		
	19-Agriculture Production Area		
	20-Agriculture Mechanics Area		
	21-Comprehensive Ornamental Horticulture Area		
Spatial Features			
Size-Width	Record actual feet 01-99		9-10
Size-Length	Record actual length 01-99		11-12
Size-Height	Record actual feet 01-99		13-14
Storage Area	Record actual area 001-999		15-17

Table B.1. Continued.

Item	Instruction	Card No.	Field
Construction Features			
Treatment-Floor	1. Concrete or wood 2. Carpeting 3. Tile 4. Other		18
Treatment-Wall	1. Scrubble surface 2. Acoustically treated 3. Other		19
Treatment-Ceiling	1. Acoustical tile 2. Painted plaster 3. Exposed structure 4. Other		20
Doors-Overhead-width	Record actual feet 01-99		21-22
Doors-Overhead-height	Record actual feet 01-99		23-24
Doors-Exterior-width	Record actual inches 01-99		25-26
Doors-Interior-width	Record actual inches 01-99		27-28
Electrical Features			
Lighting-Scheme	1. Overhead 2. Spot-work directed 3. Combination of above 4. Other		29
Wall Outlets-Number	Record actual number 01-99		30-31
Wall Outlets-Voltage	1. 110 volts 2. 220 volts 3. Combination 4. Other		32
Machine Outlets-Service	1. Ceiling 2. Floor 3. Combination 4. Other		35
Machine Outlets-Voltage	1. 110 volts 2. 220 volts 3. 440 volts 4. Combination of above 5. Other		35
Outside Outlets	1. yes; 2. No		37
Master Control Panel	1. yes; 2. No		38
Panic Button	1. yes; 2. No.		39
Electronic Features			
Intercom	1. One 2. Two way 3. Other		40
Telephone Service	1. Yes; 2. No		41
TV Service	1. Yes; 2. No		42
Electronic Sensors	1. Yes; 2. No		43

Table B.1. Continued.

Item	Instruction	Card No.	Field
Mechanical Features-HVAC			
Station Regulation-HVAC	1. Yes; 2. No		44
Air Conditioned	1. Yes; 2. No.		45
Plumbing Service			
Water Service	1. Yes; 2. No		46
Lavatory	1. Yes; 2. No		47
Floor Drain(s)	1. Yes; 2. No		48
Hose Bibs	1. Yes; 2. No		49
Outside Water Service	1. Yes; 2. No		50
Gas Service			
Availability	1. Yes; 2. No		51
Master Control	1. Yes; 2. No		52
Compressed Air Service			
Availability	1. Yes; 2. No		53
Outside Air Service	1. Yes; 2. No		54
Health & Safety Features			
Convenient Restroom	1. Yes; 2. No		55
Lockers Available	1. Yes; 2. No		56
Convenient Drinking			
Fountain	1. Yes; 2. No		57
Convenient Hand Washing	1. Yes; 2. No		58
Dust-fume Removal	1. Yes; 2. No		59
Special Ventilation	1. Yes; 2. No		60
Fire Extinguisher			
Available	1. Yes; 2. No		61
Sprinkler System	1. Yes; 2. No		62
Exit Markings	1. Yes; 2. No		63
Alarm System	1. Yes; 2. No		64
Good Security	1. Yes; 2. No		65
Barrier Free Features			
Special Equipment	1. Yes; 2. No		66
Equipment Operability	1. Yes; 2. No		67
Adequate Entrances-			
Exits	1. Yes; 2. No		68
Adequate Horizontal-			
Vertical Movement	1. Yes; 2. No		69

Information Note

Repeat card three for each room or area within a program area. If the program in question had four columns completed on the Inspection Form then four cards would need to be prepared.

Repeat the procedure until all program and rooms or areas data cards are completed

Bldg./Site No.

4-digit code-This number is the same as 5-8 of card one (1)

1-4

Table B.1. Continued.

Item	Instruction	Card No.	Field
Site Assessment Form 28	Record the following for items 28 to 41 on this form 1. Highly satisfactory (HS) 2. Satisfactory plus (S+) 3. Satisfactory (S) 4. Satisfactory minus (S-) 5. Unsatisfactory (US) 6. Blank		5
29-41	Use instruction for item 28		6-18
Building Assessment 91	Record the following for items items 91 to 110 on this form 1. Highly satisfactory (HS) 2. Satisfactory plus (S+) 3. Satisfactory (S) 4. Satisfactory minus (S-) 5. Unsatisfactory (US) 6. Blank		19
92-110	Use instruction for item 91		20-38
Building Inspector's Cost Analysis Report			
Program Area: Agribusiness			
Plumbing Renovation	1. None; 2. Minor; 3. Major		40
HVAC Renovation	1. None; 2. Minor; 3. Major		41
Electrical Renovation	1. None; 2. Minor; 3. Major		42
General Renovation	1. None; 2. Minor; 3. Major		43
Expansion	1. Yes, 2. No		44
Program Area: Business & Office Education			
Plumbing Renovation	1. None; 2. Minor; 3. Major		46
HVAC Renovation	1. None; 2. Minor; 3. Major		47
Electrical Renovation	1. None; 2. Minor; 3. Major		48
General Renovation	1. None; 2. Minor; 3. Major		49
Expansion	1. Yes; 2. No		50
Program Area: Distributive Education			
Plumbing Renovation	1. None; 2. Minor; 3. Major		52
HVAC Renovation	1. None; 2. Minor; 3. Major		53
Electrical Renovation	1. None; 2. Minor; 3. Major		54
General Renovation	1. None; 2. Minor; 3. Major		55
Expansion	1. Yes; 2. No		56

Table B.1. Continued.

Item	Instruction	Card No.	Field
Program Area: Health Occupation			
Plumbing Renovation	1. None; 2. Minor; 3. Major		58
HVAC Renovation	1. None; 2. Minor; 3. Major		59
Electrical Renovation	1. None; 2. Minor; 3. Major		60
General Renovation	1. None; 2. Minor; 3. Major		61
Expansion	1. Yes; 2. No		62
Program Area: Home Economics			
Plumbing Renovation	1. None; 2. Minor; 3. Major		64
HVAC Renovation	1. None; 2. Minor; 3. Major		65
Electrical Renovation	1. None; 2. Minor; 3. Major		66
General Renovation	1. None; 2. Minor; 3. Major		67
Expansion	1. Yes; 2. No		68
Program Area: Trade and Industrial			
Plumbing Renovation	1. None; 2. Minor; 3. Major		70
HVAC Renovation	1. None; 2. Minor; 3. Major		71
Electrical Renovation	1. None; 2. Minor; 3. Major		72
General Renovation	1. None; 3. Minor; 3. Major		73
Expansion	1. Yes; 2. No		74
Program Area: Special Education-Secondary-Vocational			
Plumbing Renovation	1. None; 2. Minor; 3. Major		76
HVAC Renovation	1. None; 2. Minor; 3. Major		77
Electrical Renovation	1. None; 2. Minor; 3. Major		78
General Renovation	1. None; 2. Minor; 3. Major		79
Expansion	1. Yes; 2. No		80

APPENDIX C

APPENDIX C. COMPUTER LISTINGS

General Instructions for Computer Program

The program is written to run in FORTRAN IV Language as described in the IBM System/360 and System 370 FORTRAN IV Language Manual #GC28-6515-10. Control cards will have to be added in order to run the program according to the requirements of the particular computer system to be used.

In addition, the program generates a file (called 'DATA1') which is the data file to be used for the SPSS summary program. Additional control card(s) will be necessary to retrieve this file for use with the SPSS program. (Either as punched cards, or punched tape, or on magnetic tape. The SPSS program, as originally written, used punched cards.)

Documentation is written into the program via 'comment cards' to allow for changes in criteria, cost indices, construction costs, etc. In addition, documentation is provided to enable the by-passing of print outs of individual building data and provide summary data only.

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Table C.1. Continued.

[illegible]

Table C.1. Continued.

		102 PRINT# 2ND IN COLUMN 3	
		103 PRINT# 2ND IN COLUMNS 1 AND 3	
		104 PRINT# 2ND IN COLUMNS 1 AND 3	
0102410	82	DATA FORMAT(1H,100,2H,2H)	CCC
0102410	83	DATA FORMAT(1H,100,2H,2H)	
0102410	84	DATA FORMAT(1H,100,2H,2H)	
0102410	85	DATA FORMAT(1H,100,2H,2H)	CCC
		DATA AREA	
0102410	86	DATA AREA	CCC
0102450	87	DATA AREA	
0102450	88	DATA AREA	
0102450	89	DATA AREA	
0102450	90	DATA AREA	
0102450	91	DATA AREA	
0102450	92	DATA AREA	
0102450	93	DATA AREA	
0102450	94	DATA AREA	
0102450	95	DATA AREA	
0102450	96	DATA AREA	
0102450	97	DATA AREA	
0102450	98	DATA AREA	
0102450	99	DATA AREA	
0102450	100	DATA AREA	
0102450	101	DATA AREA	
0102450	102	DATA AREA	
0102450	103	DATA AREA	
0102450	104	DATA AREA	
0102450	105	DATA AREA	
0102450	106	DATA AREA	
0102450	107	DATA AREA	
0102450	108	DATA AREA	
0102450	109	DATA AREA	CCC
		REMOVE NEXT TWO (2) LINES	
0102450	110	DATA AREA	CCC
0102450	111	DATA AREA	
0102450	112	DATA AREA	
0102450	113	DATA AREA	
0102450	114	DATA AREA	
0102450	115	DATA AREA	CCC
		REMOVE NEXT TWO (2) LINES	
0102450	116	DATA AREA	CCC
0102450	117	DATA AREA	CCC

Table C.1. Continued.

011137A	187	GO TO 140	
011137B	188	T29 FORMAT(1H,35X,4NN-SLIP,AX,4NON-SLIP,/,15X,4CONCRETE,9X, 4CONCRETE,/,14X,4OR WOOD,9X,4OR WOOD)	
0111400	189	T26 WRITE(6,125)	
011140A	190	GO TO 140	
011140B	192	T28 FORMAT(1H,35X,4NN-SLIP,7X,4CARPETING,/,35X,4CONCRETE,/,36X, 4OR WOOD)	
011141B	193	T2A WRITE(12,127)	
011141A	191	GO TO 140	
011141B	195	T27 FORMAT(1H,35X,4NN-SLIP,AX,4CEMATIC,/,35X,4CONCRETE,/,10X, 4OR TILE,/,36X,4OR WOOD)	
011142B	194	T2A WRITE(12,129)	
011172B	196	GO TO 140	
011172B	198	T2B FORMAT(1H,35X,4NN-SLIP,10X,4OTHER,/,35X,4CONCRETE,/,36X, 4OR WOOD)	
011172B	199	T21 CONTINUE	
011174B	199	WRITE(12,129)	
011203B	200	GO TO(12,134,136,138),126(N,M)	
011215B	201	T22 WRITE(12,131)	
011225B	202	GO TO 150	
011225B	204	T23 FORMAT(1H,52X,4NN-SLIP,/,52X,4CONCRETE,/,52X,4OR WOOD)	
011226B	204	T2A WRITE(12,135)	
011236B	205	GO TO 150	
011236B	207	T24 FORMAT(1H,43X,4CEMATIC,/,53X,4OR TILE)	
011237B	207	T2A WRITE(12,137)	
011247B	208	GO TO 150	
011247B	210	T27 FORMAT(1H,41X,4CARPETING)	
011248B	210	T2A WRITE(12,139)	
011248B	211	GO TO 150	
011248B	213	T2B FORMAT(1H,45X,4OTHER)	
011248B	213	T21 CONTINUE	
011248B	214	GO TO(142,144,146,148),126(N,M)	
011275B	215	T22 WRITE(12,141)	
011305B	216	GO TO 150	
011305B	218	T23 FORMAT(1H,34X,4CEMATIC,AX,4NON-SLIP,/,34X,4OR TILE,9X, 4CONCRETE,/,152X,4OR WOOD)	
011305B	218	T2A WRITE(12,145)	
011316B	219	GO TO 150	
011316B	221	T24 FORMAT(1H,34X,4CEMATIC,AX,4CARPETING,/,36X,4OR TILE)	
011317B	221	T2A WRITE(12,147)	
011327B	222	GO TO 150	
011327B	224	T27 FORMAT(1H,36X,4CEMATIC,9X,4CEMATIC,/,36X,4OR TILE,9X, 4OR TILE)	
011330B	224	T2A WRITE(12,149)	
011340B	225	T2B FORMAT(1H,34X,4CEMATIC,11X,4OTHER,/,34X,4OR TILE)	
011340B	226	T21 CONTINUE	
011341B	227	T21 FLOOR,10,12A(N,M) WRITE(12,101)	
011343B	228	T21 FLOOR,10,12A(N,M) WRITE(12,102)	
011344B	229	T21 CONTINUE	
011345B	230	WRITE(12,141)	
011374B	231	T21 FORMAT(5X,4WALL,4X)	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			CCC
WALL TREATMENT			
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC			CCC
011374B	232	GO TO(165,165,165,165,165,165,165,165,165,165,165,165,165,165,165, 164,164,164,164,164,164),120(N,M)	

[illegible]

Table C.1. Continued.

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0133010 419 334 FORMAT(1H,49X,SPCMRINATIONS)
0133010 420 334 FORMAT(1H,43X,OTHERS)
0133010 421 WRITE(A,128)
0133100 422 330 FORMAT(5X,OUTSIDE OUTPUTS)
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C OUTSIDE OUTPUTS
C
0133100 423 CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C OUTSIDE OUTPUTS
C
0133100 423 330,330,330,332,332,334,332,330,330,330,334,334,330,330,
330,332,334,334,334,120(N,M)
0133170 424 332 WRITE(A,128)
0133170 425 330 TO 334
0133100 426 332 WRITE(A,104)
0133100 427 330 TO 334
0133110 428 334 WRITE(A,334)
0133110 429 334 FORMAT(1H,33X,SPFS)
0133110 430 IF(15)(N,M),EQ,1) WRITE(A,101)
0133110 431 IF(15)(N,M),NE,1) WRITE(A,102)
0133110 432 334 CONTINUE
0133110 433 IF(15)(N,M),EQ,2) GO TO 342
0133110 434 330 TO 330,330,151(N,M)
0133110 435 334 WRITE(A,340)
0133110 436 330 TO 342
0133110 437 332 WRITE(A,341)
0133110 438 334 FORMAT(1H,54X,SPFS)
0133110 439 334 FORMAT(1H,45X,SPFS)
0133110 440 334 CONTINUE
0133110 441 WRITE(A,344)
0133110 442 334 FORMAT(1H,MASTER CONTROL)
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C MASTER CONTROL
C
0133110 443 CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
0133110 444 IF(120)(N,M),LT,1) GO TO 347
0133110 445 WRITE(A,335)
0133110 446 IF(152)(N,M),EQ,1) WRITE(A,101)
0133110 447 IF(152)(N,M),NE,1) WRITE(A,102)
0133110 448 347 IF(152)(N,M),EQ,1) WRITE(A,340)
0133110 449 IF(152)(N,M),EQ,2) WRITE(A,341)
0133110 450 IF(120)(N,M),LT,1) WRITE(A,103)
0133110 451 WRITE(A,340)
0133110 452 330 FORMAT(1H,SPANIC BUTTONS)
0133110 453 IF(120)(N,M),LT,1) GO TO 350
0133110 454 WRITE(A,335)
0133110 455 IF(153)(N,M),EQ,1) WRITE(A,101)
0133110 456 IF(153)(N,M),NE,1) WRITE(A,102)
0133110 457 347 IF(120)(N,M),LT,1) WRITE(A,103)
0133110 458 IF(153)(N,M),EQ,1) WRITE(A,340)
0133110 459 IF(153)(N,M),EQ,2) WRITE(A,341)
0133110 460 WRITE(A,355)
0133110 461 334 FORMAT(1H,FLIGHTMANIC FEATURES,1/5X,INTERCOM)
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
C INTERCOM
C
0133110 462 CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C

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Table C.1. Continued.

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0136530 441 354 FORMAT(1H,51X,80HE-WAVE)
0136530 442 357 FORMAT(1H,51X,8TWD-WAVE)
0136530 443 359 FORMAT(1H,51X,80HE#)
0136530 444 359 FORMAT(1H,51X,80HE-WAVE)
0136530 445 IF (154(N,M),EQ,1) WRITE(A,354)
0136530 446 IF (154(N,M),EQ,2) WRITE(A,357)
0136750 447 IF (154(N,M),EQ,3) WRITE(A,358)
0137050 448 IF (120(N,M),EQ,2) GO TO 360
0137100 449 WRITE(A,361)
0137170 470 GO TO 361
0137200 471 365 IF (154(N,M),EQ,1),OR,(154(N,M),EQ,2)) WRITE(A,361)
0137370 472 IF (154(N,M),NE,1),AND,(154(N,M),NE,2)) WRITE(A,362)
0137540 473 WRITE(A,360)
0137630 474 361 CONTINUE
0137640 475 WRITE(A,363)
0137730 476 368 FORMAT(54,8TELEPHONE SERVICE)
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC C C C
TELEPHONE SERVICE
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC C C C
0137730 477 IF (155(N,M),EQ,1) WRITE(A,360)
0140040 478 IF (155(N,M),EQ,2) WRITE(A,361)
0140150 479 GO TO 372,371,370,370,370,370,370,371,371,372,372,369,372,372,372,
372,372,372,372,370,120(N,M)
0140500 480 369 WRITE(A,361)
0140600 481 GO TO 380
0140610 482 370 WRITE(A,364)
0140710 483 GO TO 380
0140720 484 371 WRITE(A,365)
0141020 485 IF (1)
0141020 486 GO TO 373
0141040 487 372 WRITE(A,375)
0141140 488 375 FORMAT(1H,39X,80HE)
0141140 489 IF (1)
0141140 490 373 IF (TEL,EQ,155(N,M)) WRITE(A,361)
0141180 491 IF (TEL,NE,155(N,M)) WRITE(A,362)
0141410 492 369 WRITE(A,361)
0141510 493 381 FORMAT(57,8TV SERVICE)
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC C C C
TV SERVICE
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC C C C
0141510 494 IF (156(N,M),EQ,1) WRITE(A,360)
0141620 495 IF (156(N,M),EQ,2) WRITE(A,361)
0141730 496 GO TO 383,383,383,383,385,385,385,385,385,385,383,383,383,383,
383,385,383,385,385,383,120(N,M)
0142230 497 382 WRITE(A,364)
0142330 498 GO TO 390
0142340 499 383 WRITE(A,365)
0142440 500 IF (156(N,M),EQ,1) WRITE(A,361)
0142550 501 IF (156(N,M),NE,1) WRITE(A,362)
0142660 502 384 WRITE(A,361)
0142760 503 385 FORMAT(57,8ELECTRONIC SENSORS)
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC C C C
ELECTRONIC SENSORS

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Table C.1. Continued.

0146430	563	270	FORMAT(1H,999,999999)	
0146430	564		IF(120(N,M),NF,2) GO TO 420	
0146450	565		WRITE(A,103)	
0146460	566		GO TO 434	
0146490	567	434	WRITE(A,134)	
0146490	568		IF(140(N,M),FO,1) WRITE(A,101)	
0146760	569		IF(140(N,M),NF,1) WRITE(A,102)	
0146770	570	434	WRITE(A,434)	
0147170	571	434	FORMAT(5X,DRINKING FOUNTAIN)	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
DRINKING FOUNTAIN				
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
0147170	552		IF(172(N,M),FO,1) WRITE(A,340)	
0147300	553		IF(172(N,M),FO,2) WRITE(A,341)	
0147410	554		IF(120(N,M),OT,2) GO TO 480	
0147430	555		WRITE(A,103)	
0147520	556		GO TO 435	
0147530	557	435	WRITE(A,135)	
0147630	558		IF(172(N,M),FO,1) WRITE(A,101)	
0147740	559		IF(172(N,M),NF,1) WRITE(A,102)	
0150050	560	434	WRITE(A,434)	
0150150	561	434	FORMAT(5X,2) LAVATORY	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
LAVATORY				
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
0150190	562		IF(141(N,M),FO,1) WRITE(A,340)	
0150260	563		IF(141(N,M),FO,2) WRITE(A,341)	
0150370	564		IF(120(N,M),NF,2) GO TO 480	
0150410	565		WRITE(A,103)	
0150500	566		GO TO 445	
0150510	567	445	WRITE(A,135)	
0150610	568		IF(141(N,M),FO,1) WRITE(A,101)	
0150720	569		IF(141(N,M),NF,1) WRITE(A,102)	
0151030	570	445	WRITE(A,445)	
0151130	571	445	FORMAT(5X,FLOOR DRAIN)	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
FLOOR DRAIN				
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
0151170	572		IF(142(N,M),FO,1) WRITE(A,340)	
0151240	573		IF(142(N,M),NF,1) WRITE(A,341)	
0151350	574		GO TO(450,450,451,451,450,450,451,451,451,450,451,451,450,451,451,450,451)	
0151440	575	445	WRITE(A,135)	
0151740	576		GO TO 455	
0151750	577	455	WRITE(A,135)	
0152050	578		IF(142(N,M),FO,1) WRITE(A,101)	
0152160	579		IF(142(N,M),NF,1) WRITE(A,102)	
0152270	580	445	WRITE(A,445)	
0152370	581	445	FORMAT(5X,OUTSIDE WATER SERVICE)	
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC				CCC
OUTSIDE WATER SERVICE				

Table C.1. Continued.

[illegible]

Table C.1. Continued.

0166660	693	IF (170(N,M),EQ,1) WRITE(A,550)	CCC
0166670	694	IF (170(N,M),NE,1) WRITE(A,551)	
0166700	695	WRITE(A,549)	
0166770	696	\$\$\$ FORMAT(9X,ADDDN SPECURITY)	CCC
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
		NONN SPECURITY	
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	CCC
0166770	697	IF (171(N,M),EQ,1) WRITE(A,550)	
0167100	698	IF (171(N,M),NE,1) WRITE(A,551)	
0167210	699	WRITE(A,550)	
0167300	700	\$\$\$ FORMAT(12,SHADDID FREE FEATURES,/,3X,SPSPECIAL EQUIPMENT)	CCC
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
		SPECIAL EQUIPMENT	
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	CCC
0167300	701	IF (172(N,M),EQ,1) WRITE(A,550)	
0167410	702	IF (172(N,M),NE,1) WRITE(A,551)	
0167420	703	WRITE(A,550)	
0167410	704	\$\$\$ FORMAT(12,ADDEQUATE ENTRANCES-E(173))	CCC
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
		ADDEQUATE ENTRANCES-PRITS	
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	CCC
0167410	705	IF (174(N,M),EQ,1) WRITE(A,550)	
0167720	706	IF (174(N,M),NE,1) WRITE(A,551)	
0170330	707	WRITE(A,550)	
0170120	708	\$\$\$ FORMAT(12,ADDEQUATE MOV MOVEMENT)	CCC
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
		ADDEQUATE MOV MOVEMENT	
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	CCC
0170120	709	IF (175(N,M),EQ,1) WRITE(A,550)	
0170230	710	IF (175(N,M),NE,1) WRITE(A,551)	
0170340	711	WRITE(A,550)	
0170430	712	\$\$\$ FORMAT(12,2X,10X,NOTE(1,3X,ONA = NOT APPLICABLE,/,3X, DUNP = NO CRITERIA))	CCC
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
		AT THIS POINT, THE PROGRAM CYCLES BACK UNTIL TAILN FOR ALL ROOMS IN ALL PROGRAM AREAS HAVE BEEN GENERATED.	
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	CCC
0170430	713	IF CONTINUE	
0170410	714	DO 11 1=1,95	
0170540	715	IF (11=0)	
0170540	716	IF CONTINUE	CCC
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
		AT THIS POINT, THE LAST CARD FOR EACH BUILDING IS READ.	
		CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	CCC
0170910	717	READ(15,15) (177(11),11=96,171)	

ccc

Table C.2. Program Listing for SPSS.

PURDUE UNIVERSITY COMPUTING CENTER				07/19/70.	21.25.57.
S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES					
VERSION 7.0 -- MARCH 1, 1970					
FOR JACO					
STATUS OF VOCATIONAL EDUCATION FACILITIES BY ECONOMIC REGION					
VARIABLE LIST 11116-1129					
TOTAL RECORDS 10000					
INPUT FORMAT 11116(10X)P2.0(2X)59(1.0)					
ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS					
VARIABLE	FORMAT	RECORD	COLUMNS		
11116	P 2.0	1	01- 7		
11117	P 1.0	1	15- 15		
11118	P 1.0	1	19- 19		
11119	P 1.0	1	15- 15		
11120	P 1.0	1	16- 16		
11121	P 1.0	1	17- 17		
11122	P 1.0	1	16- 16		
11123	P 1.0	1	17- 17		
11124	P 1.0	1	20- 20		
11125	P 1.0	1	21- 21		
11126	P 1.0	1	22- 22		
11127	P 1.0	1	23- 23		
11128	P 1.0	1	24- 24		
11129	P 1.0	1	25- 25		
11130	P 1.0	1	26- 26		
11131	P 1.0	1	27- 27		
11132	P 1.0	1	28- 28		
11133	P 1.0	1	29- 29		
11134	P 1.0	1	30- 30		
11135	P 1.0	1	31- 31		
11136	P 1.0	1	32- 32		
11137	P 1.0	1	33- 33		
11138	P 1.0	1	34- 34		
11139	P 1.0	1	35- 35		
11140	P 1.0	1	36- 36		
11141	P 1.0	1	37- 37		
11142	P 1.0	1	38- 38		
11143	P 1.0	1	39- 39		
11144	P 1.0	1	40- 40		
11145	P 1.0	1	41- 41		
11146	P 1.0	1	42- 42		
11147	P 1.0	1	43- 43		

Table C.2. Continued.

STATUS OF VOCATIONAL EDUCATION FACILITIES BY ECONOMIC REGION				07/19/79	21:25:59
ACCORDING TO YOUR INPUT FORMS, VARIABLES ARE TO BE READ AS FOLLOWS:					
VARIABLE	FORM#	RECORD	COLUMNS		
1127	P 1a B	1	99	99	
1128	P 1a B	1	99	99	
1129	P 1a B	1	99	99	
THE INPUT FORM# PROVIDES FOR 32 VARIABLES. 32 WILL BE READ. IT PROVIDES FOR 1 RECORDS (RECORD #) PER CASE. A MAXIMUM OF 96 COLUMNS ARE USED IN 1 RECORD.					
N OF CASES	CONTINUED				
VARIABLES	ECONOMIC REGION#				
	191 ACCEPTABLE LOCATION FOR A SCHOOL SITE/				
	192 ACCEPTABLE HEALTH, SAFETY, AND SECURITY/				
	193 ACCEPTABLE COMPATIBILITY WITH AREA/				
	194 CONVENIENCE TO USERS/				
	195 CONVENIENCE TO SERVICE UTILITIES/				
	196 ACCESSIBLE TRAFFIC PATTERNS AND FLOW/				
	197 SUFFICIENT SITE SIZE AND SHAPE/				
	198 SUFFICIENT TERRAIN AND TOPOGRAPHY/				
	199 DISTINCTIVE PLANNING/				
	199 SITE SURFACES AND LANDSCAPING/				
	199 DRIVEWAYS, WALKS, AND PARKING/				
	199 LAYOUT AND ALLOCATIONS/				
	199 SITE PLANTING OVERALL ADEQUACY/				
	199 SITE IMPROVEMENT OVERALL ADEQUACY/				
	199 UTIL. SERVICES AND LAYOUT/				
	199 UTIL. SERVICES - L & A /				
	199 QUALITY OF CONSTRUCTION/				
	199 CLIMATE CONTROL/				
	199 CLIMATE CONTROL--HVAC/				
	199 ENERGY SOURCES AND EFFICIENCY/				
	199 LIGHTING AND FIRE-CONTROL CAPABILITY/				
	199 VISUAL PERCEPTIBILITY-EFFICIENCY/				
	199 PERSONAL CARE CONVENIENCE/				
	199 DESIGN FEATURES SUPPORT FOR HEALTH/				
	199 HAZARD CONTROL--FIRE, FLOOD, EXPLOSION/				
	199 STRUCTURAL-IMPULSIVE CONDITIONS - SAFETY/				
	199 INTERNAL MOVEMENT OF PEOPLE --H-V--/				
	199 EXTERNAL MOVEMENT --PEOPLE-VEHICULAR--/				
	199 OFFICE SOURCES AND SERVICES/				
	199 SPECIAL EQUIPMENT INSTALLATIONS/				
	199 DURABILITY OF STRUCTURAL ENVELOPE/				
	199 STRUCTURAL DESIGN FEATURES/				
	199 OVERALL ADEQUACY OF CONSTRUCTION/				
	199 EDUCATION FEATURES OVERALL ADEQUACY				
	199 TO 199 EFFICIENCY, SAFETY, QUALITY, PLUS				
	199 SATISFACTORY DESIGN, DESIGN 1500 SATISFACTORY				
	199 RATED				
	MISSING VALUE = 9999				
	CONTINUITY				
	VARIABLES TO 1127, 1128, 1129, 1130, 1131, 1132				
	1127 TO 1129 OF FORM				
	1127				
	READ FROM DATA				
END 1700 END OF DATA FOR CROSSING					

APPENDIX VI

- Exhibit VI.1. Example Assessment Packet
- Exhibit VI.2. Inspection Form - Alternative Answers
- Exhibit VI.3. Site Sample ID Coding Sheet (Example)
- Exhibit VI.4. Program Area/Course Identification & ID Code
- Exhibit VI.5. Special Equipment by Program Area

Exhibit VI.1

Assessment Packet (Clarification and Example)

This appendix is intended to provide examples of maps, completed forms, photographs of facilities and other miscellaneous materials which would comprise an actual vocational facility assessment.

The Assessment Packet (Exhibit VI.1) is designed to assist in training the field inspectors after they are thoroughly familiar with the project report and the Guidelines for Planning Vocational-Technical Education Facilities (DPI - Division Vocational Education). The inspectors must be particularly aware of the sections of the report which define, discuss the assessment criteria (e.g., site: accessibility, acceptability, and suitability), and explain the cost and cost estimating procedures. Maps, site plants, building plans, and photos should also be obtained, labeled, and included to assist the reader of the report.

The front page of the Assessment Packet is an identification and general information page. The areas denoted by A, B, and D will be completed, based on information provided by the school administrators. The information necessary to complete area B will be obtained from the official school coding information provided by the Department of Public Instruction. It is suggested that a tabulation be made similar to the example provided after the assessment packet for all vocational facilities inspected (see Exhibit VI.3). Area "E" will be completed after the site inspection. The basic

information will be derived from the cost information sections of the project report and information gained from local sources (e.g., school administrators and local real estate agents). A comments section is provided at the bottom of the page for a brief overview of the facility. On the lower right-hand side of the page, space is provided for the inspector's name and date of inspection.

The inspection forms are located after the general information page. The example shows the detail and typical information that should be included in the answers for each question. Since the inspection form is a quantitative type sheet, the questions asked require physical measurements or observations in the responses, such as ceiling height, room width, window area, and door size. The observation questions involve recording a response from alternative choices such as 1) non slip/wood or concrete, 2) carpet, 3) tile, and 4) other. The Inspection Form-Alternative Answers (see Exhibit VI.2) provides the various descriptive answers for the questions assessing non-measurable data. The alternative answers correspond to the key-punch coding sheet used in the computer analysis. These descriptive terms should be used.

At the top of the inspection form are basic room identification questions concerning courses, room numbers, number of student stations, and room usage. This information must be obtained from the administrators or tour guide. A list of program areas, courses, and state course ID numbers is

provided in Exhibit VI.4 of this appendix. It is very important that this information be complete and accurate. The basic identification information is utilized in making comparisons between actual assessment data and state guidelines and standards. At the bottom of each page, space is provided for notes and general observations.

Special equipment and features must be observed and recorded in each classroom. Most of the equipment that will be assessed in the on-site inspection is listed by program area in Exhibit VI.5 of this appendix.

The School Building/Site Assessment Packet questions are generally self-explanatory. Definitions for each component area such as accessibility, spacial, thermal, etc., and basic discussions are provided earlier in the report. Once the inspector is familiar with these sections, the intent of each question is generally clear. One important procedure to note, however, is that the specific detailed questions under each sub-component should be answered first. Once the questions have been completed, the sub-component can be determined. After all sub-components for all component areas have been completed, the recapitulation page can be completed. Always work from detail to overall, completing each level of detail prior to proceeding to a lesser detailed area. Any detailed question, sub-component question, or recapitulation question determined to be poor or unsatisfactory could be explained under the particular question involved. Examples of proper notations are located throughout the example assessment packet.

NOTE: THE INFORMATION IN THIS EXAMPLE IS NOT FACTUAL AND DOES NOT RELATE TO ANY INDIVIDUAL FACILITY. PICTURES, MAPS, DRAWINGS, ETC... HAVE BEEN ALTERED FOR ILLUSTRATION PURPOSES ONLY.

SCHOOL BUILDING/SITE ASSESSMENT PACKET

EXHIBIT _____

School Institution: Marion County **A**

Building/Site: Jones Area High School

Location: Indianapolis, Indiana

Bldg./Site Use: Neighborhood **A**

High School

Student Levels: 9-12

Total No. Students: 2400

ID Code: 5 8 0 5
Institution

5884
Bldg./Site No.

B

40
County

8
Region

GENERAL DATA

BUILDING INFORMATION

Building Area (sq. ft.) 245,000

Explain: _____

Construction: Date Purpose

Original 1954 School

Addition(s) 1963 Ag. Building

C

Type Facility (check one)

Area Vocational School

Comprehensive High School

Other (specify)

Number of Floors

Below Ground 1

Above Ground 3

Total Number 4

SITE INFORMATION

Site size (acres) 26 acres

Shape of site: square ;

rectangular X; irregular

Acres contiguous: Yes X; No

Site Status (check one) **D**

Being considered

Owned (being used) X

Owned (not being used)

No. Bldgs. on Site 3

COST INFORMATION **E**

Site value \$15,000/Ac Act ; Est X

Bldg. value \$38.00/SF Act ; Est X

Explain Estimated based on realtor
communications & Dodge Manual

COMMENTS: School currently involved in Vocational
Re-organization between Tech, Short-ridge, & Attucks. Currently offering
D.E., Ag, COE, & will offer PVE next term.
by: Thomas Doe
date: 1/25/78

INSPECTION FORM

EXHIBIT _____

FProgram Area D.E.Institution Jones Area H.S.
IndianapolisIdentificationSALESMANSHIP

Station Number #320 (Mrs. Smith) # 312 (Mrs. Smith)
 Number Student Stations 25

Physical Features

Type (Clrm, Lab, Shop)	Class Room	Office (Shared/4 teachers)
Size (area)	744 S.F.	40 S.F. (allocated)
Width	31	5'
Length	24	8'
Height	10	10
Storage (w x l)	4'x24" + closet (4'x3')	None

Construction Features

<u>Treatments (interior)</u>		
Floor	Carpet	Carpet
Wall	Masonry	Masonry
Ceiling	Acoustical	Acoustical
<u>Structural System</u>		
Framing	Steel	Steel
Wall	Masonry	Masonry
<u>Doors</u>		
Overhead (w x h)		
Exterior (w x h)	3'x7'	3'x7'
Interior (w x h)		
<u>Windows</u>		
Window area	52 S.F. (32" x 4 1/4" / 6 ea)	15 S.F. (3'x5')
Height off floor	0"	40"

Electrical Features

<u>Lighting</u>	Flourescent	Flourescent
Type fixtures	3 strips/2 bulbs/30'	3 strips/2 bulbs/7'
Number switches	2	1
Light scheme	overhead & task	Overhead
<u>Power</u>		
Wall outlets		
No. outlets	12	2
Height/space	2' / 8'	2' / NA
Voltage(s)	110	110
Machine outlets		
No. outlets	4	None
Service (clng./flr.)	Floor	NA
Voltage(s)	110	NA
No. outside outlets	-0-	-0-
Master control	No	No
Panic button	No	No

Electronic Features

Intercom (1w, 2w, o)	1 way	1 way
Telephone service	No	No
TV service	No	No
Electronic sensors	No	No

Notes: Inadequate work areas, & no private counseling areas. No display areas. No telephone for arranging interviews. Inadequate storage areas.



D.E.
Jones Area H.S.
Indianapolis

Mechanical Features

HVAC systems

#320

Energy source(s) Gas
Type heat system Boiler
Station regulation of HV ... No
Air conditioned Yes

Plumbing service

Water service Yes
Drinking fountain No
Lavatory Yes
Floor drain(s) No
Hose bibs No
Outside water service No

Gas Service

Availability No
Type service NA
No. gas outlets NA
Master control NA

Compressed air service

Availability No
No. disconnect outlets NA
Outside air service NA

Health and Safety Features

Health

Convenient restrooms Yes
Lockers available Yes
Convenient drinking fountain Yes
Convenient hand washing Yes
Dust-fume removal No
Special ventilation No

Safety

Fire ext. available Yes
Sprinkler system No
Exit markings Yes
Alarm system Yes
Clear traffic lanes Yes
Good security Yes

Carrier Free Features

Special equipment No
Equipment operability NA
Adequate entrances-exits Yes
Adequate H-V movement No

Special Equipment Features

Specify Projector ... Yes-Built-in
Specify Recording Equipment Yes-Built-in
Specify Special Platform & Lighting

Other Feature(s)

Specify Alum. Awning Windows

Restrooms convenient but not equipped with handicapped facilities.
No adequate elevator facilities. Building totally inaccessible to handicapped.

by: Thomas Doe

date: 1/25/78

ACCEPTABILITY

- 1 ② 3 4 1. Compatibility with others in area
 1 ② 3 4 Business/industry compatibility
 1 ② 3 4 Residential compatibility
 1 ② 3 4 Services compatibility
- 1 ② 3 4 2. Conditions of site surroundings
 1 2 ③ 4 Risk free/safe place
 1 ③ 3 4 Security provisions
 1 ③ 3 4 Zoning law protection
 *Heavy traffic & poor traffic controls.
- 1 2 ③ 4 3. Traffic flow tolerability
 1 2 ③ 4 Traffic disruption tolerability
 1 ② 3 4 Traffic noise tolerability
 1 2 ③ 4 Traffic congestion tolerability
- 1 ② 3 4 4. Hazard freeness of surrounding areas
 *Very congested during rush hours.
 1 ② 3 4 Pedestrian traffic routes
 1 2 ③ 4 Traffic crossing controls
 1 ② 3 4 Route safety to area
- 1 ② 3 4 5. Sub-group identity with area
 *Inadequate and ineffective
 1 ② 3 4 Age groups
 1 ② 3 4 Socio-economic groups
 1 ② 3 4 Racial groups
- 1 ② 3 4 6. Neighborhood desirability
 1 ② 3 4 Commercial-industrial fit
 1 2 3 ④ Rural-farm area fit
 1 ② 3 4 Residential area fit
- 1 ② 3 4 7. Environmental Quality of Area
 * Inter-city
 1 ② 3 4 Dust-dirt freeness
 1 ② 3 4 Fume-odor freeness
 1 ② 3 4 Noise tolerability

ACCESSIBILITY

- 1 ② 3 4 8. Convenience to public services
 1 ② 3 4 Fire services
 1 ② 3 4 Police services
 1 ② 3 4 Transportation services
- 1 ② 3 4 9. Convenience to public utilities
 1 ② 3 4 Electricity
 1 ② 3 4 Gas
 1 ② 3 4 Water and sewer
- 1 ② 3 4 10. Barrier freeness of site approaches for handicapped
 1 2 ③ 4 Common level-gentle slope walks
 1 ② 3 4 Clear vision traffic lanes
 1 ② 3 4 Non-slip surfaces
 *Long steep walks and ramps

RATING SCALE :

1 - Good

3 - Poor

2 - Average

39 269

4 - Cannot judge

- 1 ② 3 4 11. Convenience to users of facility
 1 ② 3 4 Persons who walk
 1 ② 3 4 Persons who are transported public
 1 ② 3 4 Persons who commute privately
- 1 ② 3 4 12. Approach to the site
 1 ② 3 4 Roads to site
 1 ② 3 4 Walks to site
 1 ② 3 4 Bike lanes to site
- 1 2 ① 4 13. Site entry-exit efficiency
 1 ② 3 4 Entry-exit convenience
 1 2 ② 4 Entry-exit controls
 1 2 ② 4 Entry-exit safety

*Inadequate for traffic load

SUITABILITY

- 1 ② 3 4 14. Desirability of site contour
 1 ② 3 4 Elevation
 1 ② 3 4 Surface drainage
 1 ② 3 4 Erosion controllability
- 1 ② 3 4 15. Adequacy of soil structure
 1 ② 3 4 Porous sub-soil
 1 ② 3 4 Soil base
 1 ② 3 4 Ease of surface adaptation
- 1 ② 3 4 16. Potential for site adaptation and preparation
 1 ② 3 4 w/o extensive fill and cutting
 1 ② 3 4 w/o extensive drain pits and shoring
 1 ② 3 4 w/o extensive retaining walls
- 1 ② 3 4 17. Impact of site to area
 1 ② 3 4 Site aesthetics
 1 ② 3 4 Seclusion of unsightly places
 1 ② 3 4 Potential for landscaping
- 1 ② 3 4 18. Dimension-layout acceptability
 1 ② 3 4 Size in acres
 1 ② 3 4 Shape of width to length
 1 ② 3 4 Space utilization potential

DEVELOPMENT

- 1 ② 3 4 19. Building placement(s) on site
 1 ② 3 4 Building orientation(s)
 1 ② 3 4 Buildings placed back from street
 1 ② 3 4 Feasibility for site arrangements
- 1 ② 3 4 20. Status of landscaping
 1 ② 3 4 Building-site appearance
 1 ② 3 4 Plantings-vegetation condition
 1 ② 3 4 Grounds care condition

RATING SCALE

1 - Good
 3 - Poor

270
 40

2 - Average
 4 - Cannot judge or doesn't apply

- 1 ② 3 4 21. Site surfaces planning
1 ② 3 4 All-weather surfacing
1 ② 3 4 Turf areas
1 ② 3 4 Apparatus areas
- 1 2 ③ 4 22. Vehicular traffic drives
1 2 ③ 4 Double lane drives with turnaround
1 2 ③ 4 Clear vision w/o circling building
1 2 ③ 4 Building service drives
*Poor vision, service traffic conflicts
- 1 2 ③ 4 23. Status of parking areas
1 2 ③ 4 Lot(s)-spaces available
1 2 ③ 4 Accessibility to building entrances
1 2 ③ 4 Space width adequacy (handicapped)
- 1 ② 3 4 24. Pedestrian traffic walks
1 ② 3 4 Width of walks
1 2 ③ 4 Common level on gentle ramps of walk
1 ② 3 4 Non-slip surfaces & railings if needed
*Walks are typical but not wide enough or common level
- 1 ② 3 4 25. Vehicle disembarking and facility entry ramps
1 ② 3 4 On-site bus stops
1 2 ③ 4 Level platforms/unloading docks
1 ② 3 4 Disembarking/unloading convenience
- 1 ② 3 4 26. Site safety-security
1 ② 3 4 Lighting adequacy
1 2 ③ 4 Traffic controls and markings
1 ② 3 4 Suitable fences and storage
- 1 ② 3 4 27. Site layout and allocations
1 ② 3 4 Instructional area allocations
1 ② 3 4 Play-court-athletic allocations
1 ② 3 4 Use of areas w/o conflict

Recapitulation of Site Assessment

J

COMPONENTSRATING SCALE

		HS	S+	S	S-	US
<u>Acceptability</u>	28- Location for a school site	1	2	3	4	5
	29- Health, safety, and security	1	2	3	4	5
	30- Compatibility with area	1	2	3	4	5
<u>Accessibility</u>	31- Convenience to users	1	2	3	4	5
	32- Convenience to service & utilities	1	2	3	4	5
	33- Traffic patterns and flow	1	2	3	4	5
<u>Suitability</u>	34- Site size and shape	1	2	3	4	5
	35- Terrain and topography	1	2	3	4	5
	36- Distinctive planning	1	2	3	4	5
<u>Development</u>	37- Site surfaces and landscaping	1	2	3	4	5
	38- Drives, walks, and parking	1	2	3	4	5
	39- Layout and allocations	1	2	3	4	5
<u>Specifications</u>	40- <u>Site features overall adequacy</u>	1	2	3	4	5
	41- <u>Site improvement overall adequacy</u>	1	2	3	4	5

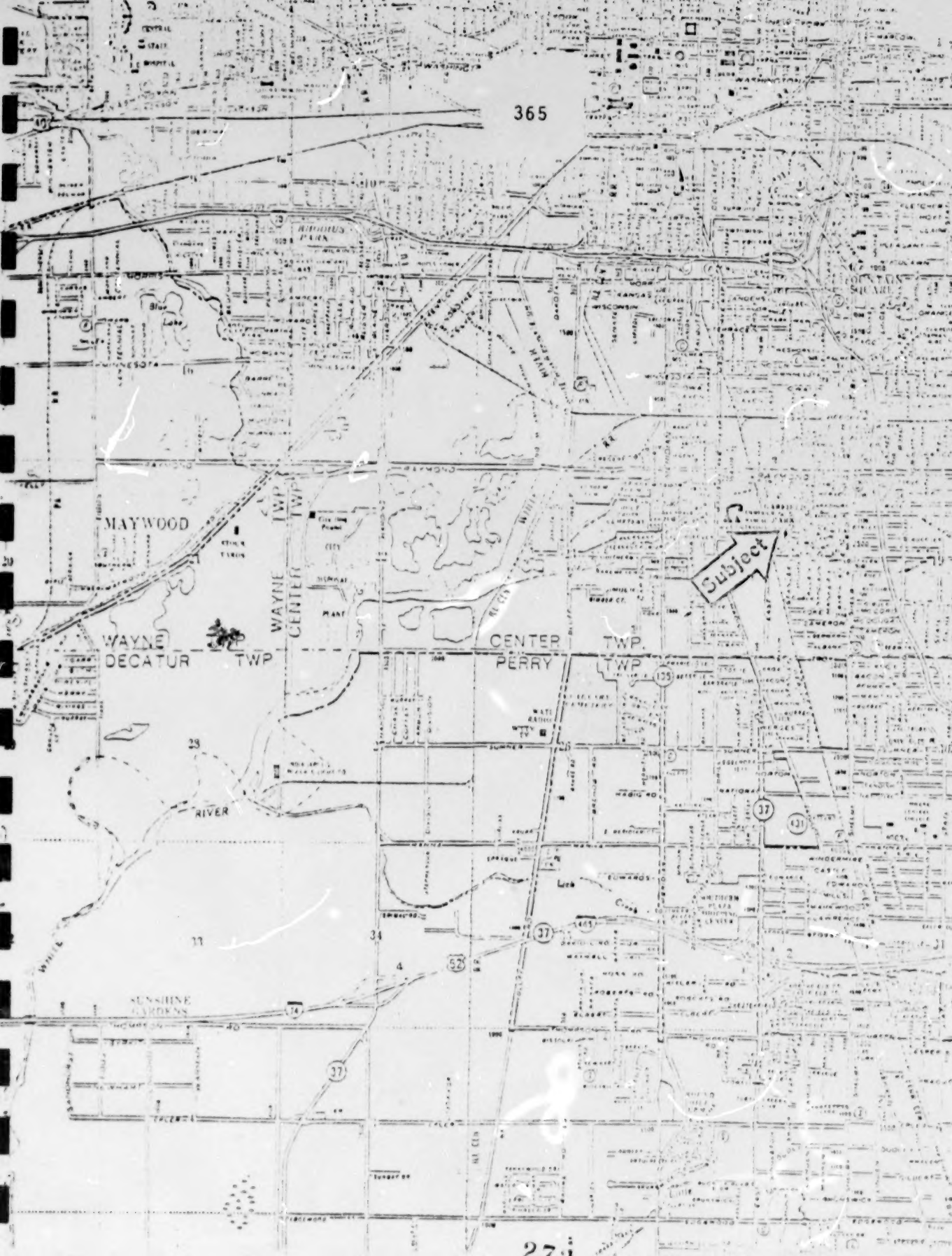
NOTES: The subject site is located on a very busy street. the traffic is very busy most of the time, and almost at a "stand still" during the morning rush hour, and evening (4:30 - 5:30 p.m.). The few traffic lights installed are not effective. Walking and bike riding is not considered very safe. Ingress and Egress is difficult most of the day and almost impossible during rush hours.

The ramps, side walks, and stairs are not accessible by the handicapped. Parking is under-sized and remote. There are no curb cuts for the handicapped.

Delivery and service traffic conflicts with student/staff traffic. There are no turn-a-rounds, and traffic vision is very poor. The site will not allow building expansion.

RATING SCALE

HS - Highly Satisfactory (1)
 S+ - Satisfactory plus (2)
 S - Satisfactory (3)
 S- - Satisfactory minus (4)
 US - Unsatisfactory (5)



365

MAYWOOD

WAYNE
DECATUR

WAYNE
CENTER
TWP

CENTER
PERRY
TWP

Subject

RIVER

SUNSHINE
GARDENS

27

PARKING

PARKING

EXIT

271

A.A. HEAVY AVENUE

275

DRIVE

DRIVE

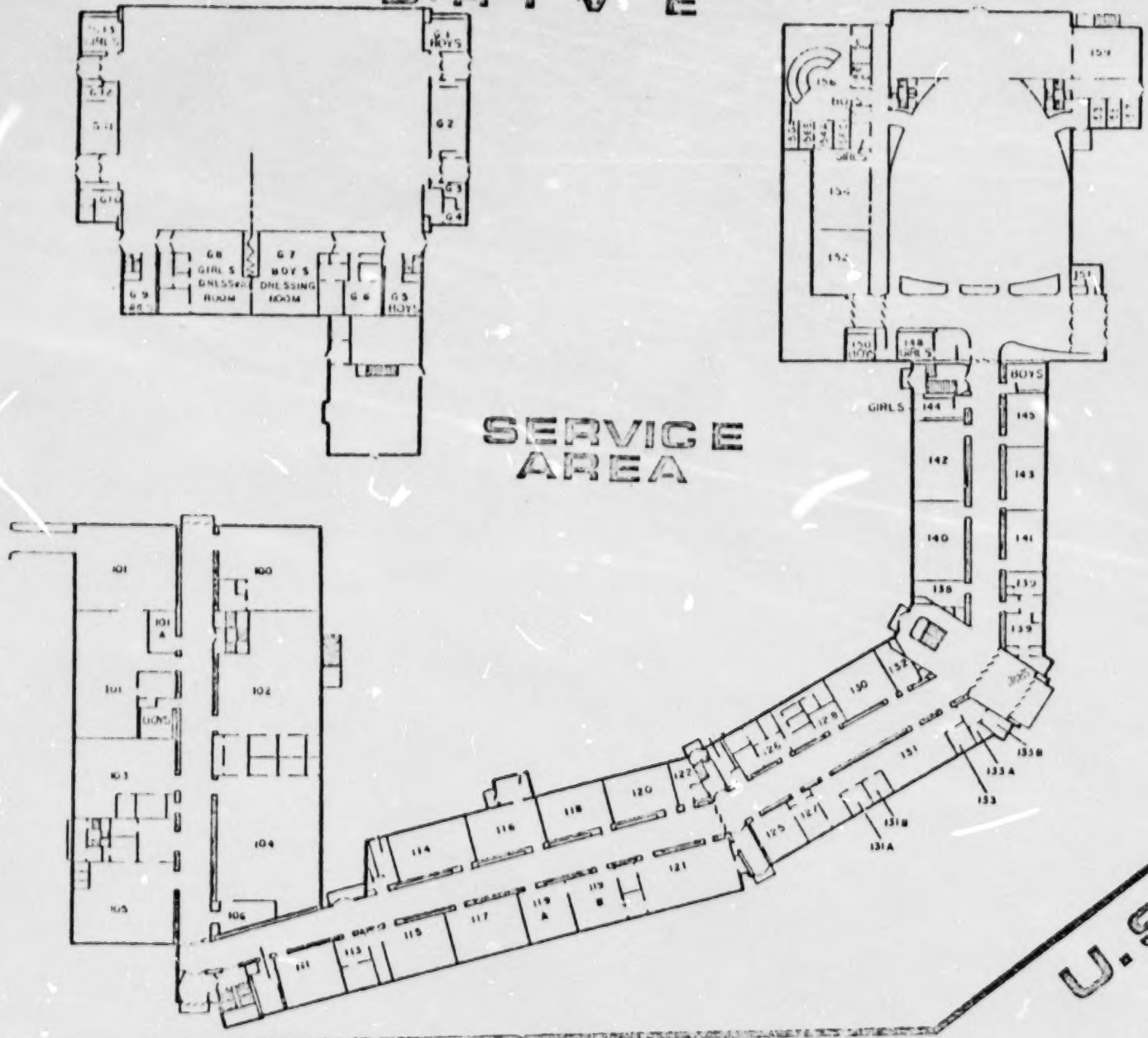
366

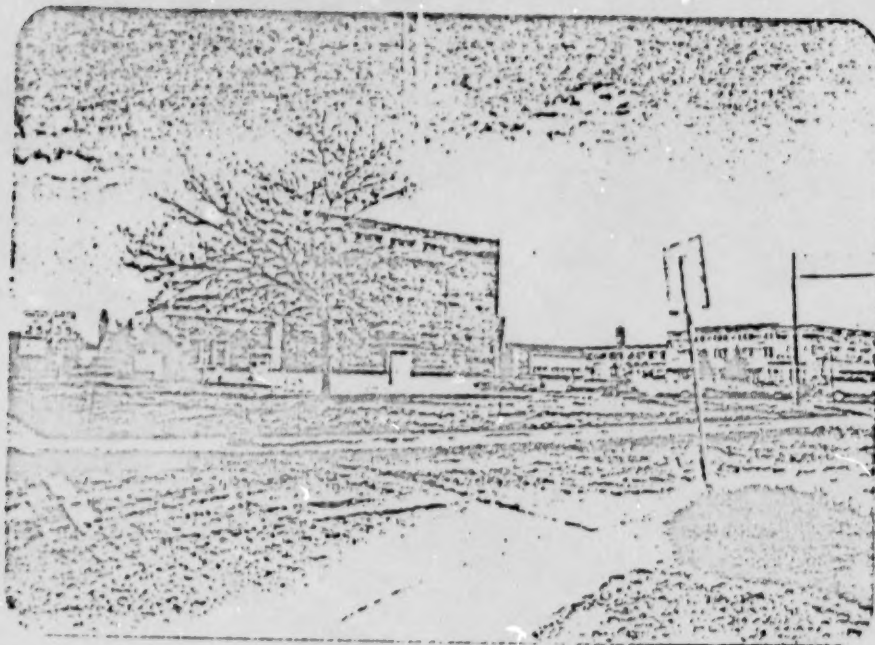
ENTRANCE

U.S. III

INDIANAPOLIS, IND.

F

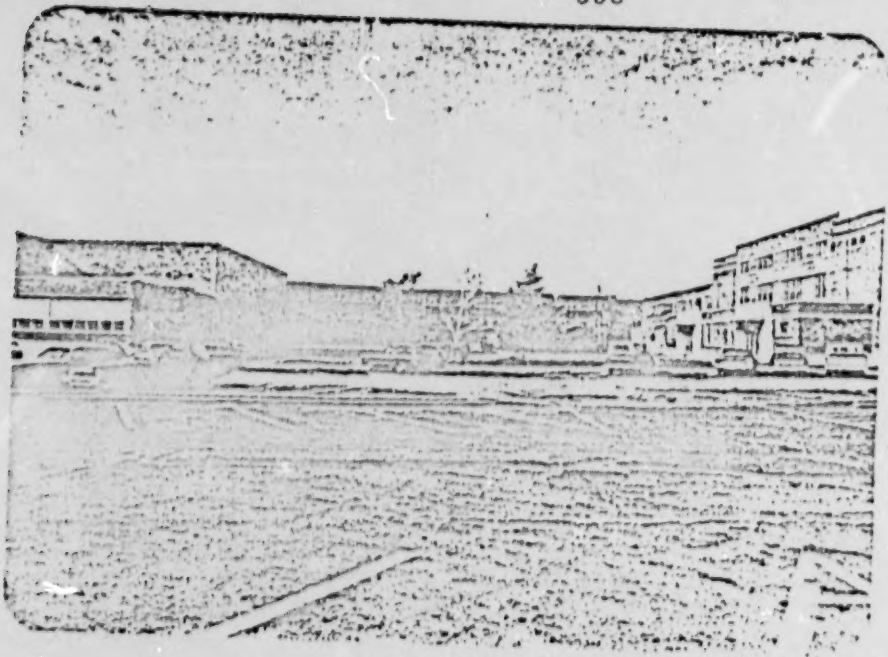




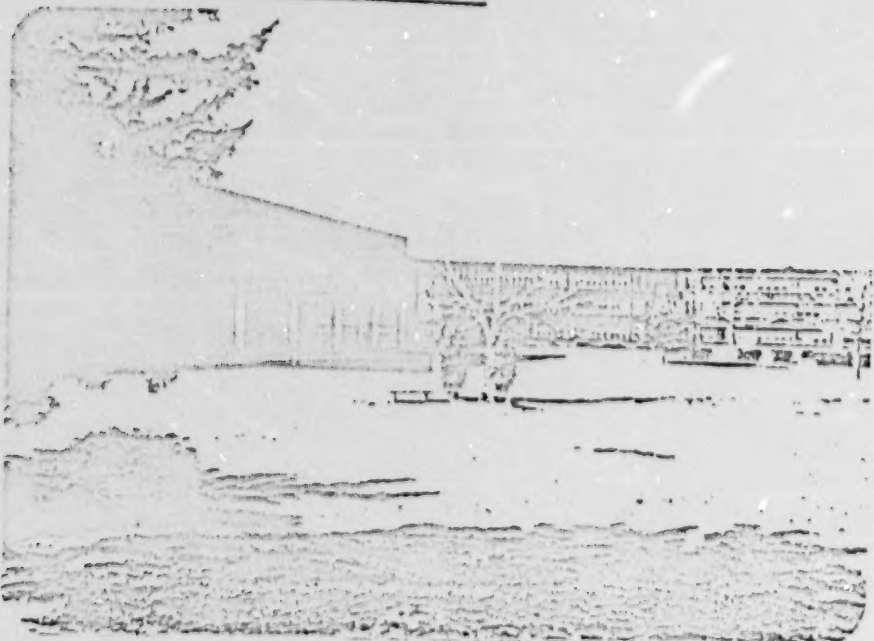
A.A. HEAVY AVENUE FROM U.S. 111



JONES AREA H. S.
INDIANAPOLIS, IND.



VIEW OF SERVICE AREA



JONES AREA H. S.
INDIANAPOLIS, IND.

EXHIBIT _____

SPATIAL COMPONENT

N

- 1 2 ③ 4 42. Availability of appropriate unit areas
 1 2 ③ 4 Association among units
 1 2 ③ 4 Design of spaces for special use
 1 2 ③ 4 Adaptability/modifiability of spaces
- 1 ② 3 4 43. Adequacy of unit sizes
 1 ② 3 4 Size to shape of spaces
 1 ② 3 4 Unobstructed heights of spaces
 1 2 ③ 4 Instructional to non-instructional areas
- 1 ② 3 4 44. Accessibility to related areas
 ① 2 3 4 Inadequate storage & office space
 1 ② 3 4 Convenience to personal care areas
 1 ② 3 4 Convenience to instructional centers
 1 ② 3 4 Convenience to service areas
- 1 ② 3 4 45. Movement and natural fit of spaces
 1 2 ③ 4 Vol Ed removed from these areas, but overall other classes are okay
 1 ② 3 4 Movement within areas
 1 ② 3 4 Movement of equipment and materials
 1 ② 3 4 Indoor-outdoor arrangements
 Vol Ed programs removed from each other

SONIC COMPONENT

- 1 ② 3 4 46. Adequacy of sound-conditioning features
 1 ② 3 4 Building envelope treatments
 1 ② 3 4 Special acoustical treatments
 1 ② 3 4 Unwanted sound restrictions
- 1 ② 3 4 47. Quality of hearing environment
 1 ② 3 4 Wanted sounds clearly heard
 1 ② 3 4 Tolerability levels of sound transmission
 1 ② 3 4 Adequacy of sound cushioning and muffling
- 1 ② 3 4 48. Adequacy of sound control
 1 ② 3 4 Isolation of noise producing activities
 1 ② 3 4 Air borne noise tolerability
 1 ② 3 4 Structure borne noise tolerability

THERMAL COMPONENT

- 1 2 ③ 4 49. Thermal adequacy based on need
 1 ② 3 4 Heat sufficiency
 1 2 ③ 4 Ventilation sufficiency
 1 2 ③ 4 Cooling sufficiency
 No regulation by room or area
- 1 2 ③ 4 50. Regulation for climate control
 1 2 ③ 4 Ability to change to heat demand
 1 2 ③ 4 System zoning for partial use
 1 2 ③ 4 Response of system to outside conditions
 Same as above

RATING SCALE

1 - Good
 3 - Poor

2 - Average
 4 - Cannot judge or doesn't apply

- 1 ② 3 4 51. Structural-thermal efficiency
- 1 ② 3 4 Design support for thermal efficiency
- 1 ② 3 4 Equipment support for thermal efficiency
- 1 ② 3 4 Low conductance and high resistance

VISUAL COMPONENT

- 1 ② 3 4 52. Adequacy of illumination for visual comfort
- 1 ② 3 4 Brightness level
- 1 ② 3 4 Ceiling-wall-floor reflection values
- 1 2 ④ 4 Task control of illumination
- 1 2 ③ 4 53. Adjustment-regulation for visual control
- 1 2 ③ 4 Availability of multiple control switches
- 1 2 ③ 4 Provision of rheostats where needed
- 1 ② 3 4 Regulation of natural light
- 1 ② 3 4 54. No regulation by area or intensity of supply
- 1 ② 3 4 Flexible and economical light system
- 1 ② 3 4 Low brightness of large areas by luminaires
- 1 ② 3 4 Lighting responsiveness to space changes
- 1 ② 3 4 Energy efficiency of illumination

HYGIENIC COMPONENT

- 1 ② 3 4 55. Personal care and conveniences for facility users
- ② 2 3 4 Restrooms conveniently accessible
- ② 2 3 4 Restroom availability for both sexes
- 1 2 ④ 4 Restroom provisions for handicapped (NONE)
- 1 ② 3 4 56. Design of lavatory-toilet facilities
- 1 ② 3 4 Clean and sanitary (w/o odor)
- 1 ② 3 4 Use of impervious materials
- 1 ② 3 4 Entrance-exit shielding
- 1 ② 3 4 57. Availability of special hand washing facilities
- 1 ② 3 4 Number of open hand washing facilities
- ④ 2 3 4 Placement of open lavatories
- 1 2 ④ 4 Operable by handicapped (NONE)
- 1 ② 3 4 58. Availability of lockers and shelves
- 1 ② 3 4 Space for personal item storage
- 1 ② 3 4 Lockers for special clothing storage
- 1 ② 3 4 Location/ventilation of lockers

SAFETY COMPONENTS

- 1 ② 3 4 59. Precautions for hazards from fumes
- 1 ② 3 4 Noxious materials storage
- 1 ② 3 4 Hood and shield protection devices
- 1 ② 3 4 Devices to handle dangerous materials
- 1 ② 3 4 60. Special hazard minimizing equipment
- 1 ② 3 4 Explosion proof electrical fixtures
- 1 ② 3 4 Special exhaust fans
- 1 ② 3 4 Electronic sensors

- | | | | | | | |
|---|---|---|-------|-----|--|--|
| 2 | 3 | 4 | ..... | 61. | <u>Safe movement of people in facility</u> | |
| | 1 | 2 | 3 | 4 | ..... | Clear traffic lanes (w/o projections) |
| | 1 | 2 | 3 | 4 | ..... | Traffic lanes lead to foyers and exits |
| | 1 | 2 | 3 | 4 | ..... | V-H traffic flow for handicapped |
| | | | | | | 3 Stories, no elevator |
| 2 | 3 | 4 | ..... | 62. | <u>Adequacy of fire safety conditions</u> | |
| | 1 | 2 | 3 | 4 | ..... | Controls for combustibile gases |
| | 1 | 2 | 3 | 4 | ..... | Adequacy of number/types of circuits |
| | 1 | 2 | 3 | 4 | ..... | Storage-disposal of combustibles |
| 2 | 3 | 4 | ..... | 63. | <u>Physical shape of facility for safety</u> | |
| | 1 | 2 | 3 | 4 | ..... | Structural soundness for safety |
| | 1 | 2 | 3 | 4 | ..... | Secure-shock proof connections |
| | 1 | 2 | 3 | 4 | ..... | Working condition of operable parts |
| 2 | 3 | 4 | ..... | 64. | <u>Adequacy of safety control equipment</u> | |
| | 1 | 2 | 3 | 4 | ..... | Emergency and fire doors |
| | 1 | 2 | 3 | 4 | ..... | Location and marking of extinguishers |
| | 1 | 2 | 3 | 4 | ..... | Adequacy of emergency lighting |

TRAFFIC FLOW COMPONENT

- | 2 | 3 | 4 | 65. | Efficiency of traffic flow in corridors |
|---|---|---|-----|---|
| | | | | 1 2 3 4 Traffic handling w/o congestion |
| | | | | 1 2 3 4 Corridors clearly distinguishable |
| | | | | 1 2 3 4 Corridor size for traffic load |
| | | | | Undersized for traffic load between classes |
| | | | 66. | Personnel-equipment movement in corridors |
| | | | | 1 2 3 4 Clear of obstructions and projections |
| | | | | 1 2 3 4 Non-slip treatment of floors |
| | | | | 1 2 3 4 Accommodate movement of handicapped |
| | | | | Handicapped must change classes before or after others. |
| | | | 67. | Personnel-equipment movement to different levels |
| | | | | 1 2 3 4 Handling 2-way traffic on stairs |
| | | | | 1 2 3 4 Ramps have gentle slope |
| | | | | 1 2 3 4 Elevators for equipment and handicapped |
| | | | | No ramps and no elevators |
| | | | 68. | Adequacy of stair-well features |
| | | | | 1 2 3 4 Availability of firm handrails |
| | | | | 1 2 3 4 Non-skid surfaces of stairs |
| | | | | 1 2 3 4 Nosing-height features of stairs |
| | | | 69. | Design of vertical movement features |
| | | | | 1 2 3 4 Location of stairs to exits |
| | | | | 1 2 3 4 Intermittent platforms for stairs |
| | | | | 1 2 3 4 Control-safety design of stair wells |
| | | | 70. | Efficiency of ingress-egress from facility |
| | | | | 1 2 3 4 Exit unit width of doors |
| | | | | 1 2 3 4 Ease of opening doors |
| | | | | 1 2 3 4 Door closure operation |
| | | | | Were not working at time of inspection |
| | | | 71. | Adequacy of door features |
| | | | | 1 2 3 4 One-level exit platforms |
| | | | | 1 2 3 4 Operation of anti-panic hardware |
| | | | | 1 2 3 4 Day-night markings of exits |

Same as above

- ② 3 4 72. Efficiency of internal traffic movement
 1 2 3 4 Traffic changes and dispersals
 1 2 3 4 Movement within suites and among areas
 1 2 3 4 Movement of equipment and freight
 Very congested between classes
 2 3 4 73. Efficiency of external traffic movement
 1 2 3 4 Location of exits for traffic flow
 1 2 3 4 Crowd movement out of facility
 1 2 3 4 Dispersals from parking areas
 Movement out of the facility very slow at days end

EQUIPMENT COMPONENT

- ② 3 4 74. Adequacy of electrical service for task demands
 1 2 3 4 Meeting power requirements
 1 2 3 4 Accessibility of power source to equipment
 1 2 3 4 Dependability/controllability of power
 2 3 4 75. Adequacy of gas service for task demands
 1 2 3 4 Meeting gas requirements
 1 2 3 4 Accessibility of gas outlets
 1 2 3 4 Dependability/controllability of gas service
 ② 3 4 76. Adequacy of compressed air for task demands
 1 2 3 4 Meeting air requirements
 1 2 3 4 Accessibility of dis-connect outlets
 1 2 3 4 Dependability/controllability of air service
 ② 3 4 77. Adequacy of water service to meet task demands
 1 2 3 4 Meeting quality-quantity requirements
 1 2 3 4 Availability of service equipment
 1 2 3 4 Dependability/controllability of water service
 ② 3 4 78. Adequacy of electronic installations for task demands
 1 2 3 4 Conduit for communication terminals
 1 2 3 4 AV/TV/computer connections/distributions
 1 2 3 4 Terminals for clocks/intercoms/telephones
 None
 2 3 4 79. Adequacy of special equipment needs
 1 2 3 4 Special exhaust systems
 1 2 3 4 Filtered-humidity controlled air
 1 2 3 4 Special drainage systems
 No controls or filtering system

STRUCTURAL COMPONENT

- ② 3 4 80. Adequacy/durability of structural support system
 1 2 3 4 Weight support/load bearing capacity
 1 2 3 4 Minimal contraction-expansion problems
 1 2 3 4 Spanning provides partition flexibility
 ② 3 4 81. Adequacy of external wall treatments
 1 2 3 4 Rigid, safe, and wear resistant
 1 2 3 4 Control of thermal conductance
 1 2 3 4 Efficiency for maintenance

RATING SCALE

1 - Good
 3 - Poor

2 - Average

4 - Cannot judge or doesn't apply

- 1 ② 3 4 82. Adequacy of internal wall technical qualities
1 ② 3 4 Partitions tight w/o vibrations
1 ② 3 4 Tolerability of noise transfer
1 ② 3 4 Facing and fire-rating quality
- 1 ② 3 4 83. Adequacy of interior wall functional qualities
1 ② 3 4 Reflections complement lighting
1 ② 3 4 Acoustical properties
1 ② 3 4 Aesthetics of finishes
- 1 ② 3 4 84. Adequacy of ceiling technical qualities
1 ② 3 4 Strength of suspension w/o air leakage
1 ② 3 4 Shape support of acoustics
1 ② 3 4 Ease of repair and maintenance
- 1 ② 3 4 85. Adequacy of ceiling functional qualities
1 ② 3 4 Reflective quality supports lighting
1 ② 3 4 Absorbent quality supports hearing
1 ② 3 4 Aesthetic quality
- 1 ② 3 4 86. Adequacy of technical floor treatments
1 ② 3 4 Treatment varies by use
1 ② 3 4 Wear qualities
1 ② 3 4 Appropriateness of resiliency
Same treatment throughout the facility
- 1 ② 3 4 87. Adequacy of functional floor treatments
1 ② 3 4 Appearance
1 ② 3 4 Acoustical quality
1 ② 3 4 Reflective features
- 1 ② 3 4 88. Adequacy of roof and roof deck
1 ② 3 4 Waterproofness of roofing system
1 ② 3 4 Handling of roof load
1 ② 3 4 Span, fire-rating, insulating qualities
- 1 ② 3 4 89. Adequacy of foundation support system
1 ② 3 4 Durability
1 ② 3 4 Waterproofness
1 ② 3 4 Appropriateness of insulation
- 1 ② 3 4 90. Adequacy of structural envelope
1 ② 3 4 Fire, wear, weather, and sound properties
1 ② 3 4 Design, shape, appearance, and materials
1 ② 3 4 Appropriateness of doors and windows

RATING SCALE

1 - Good
3 - Poor

2 - Average
4 - Cannot judge or doesn't apply

Recapitulation of Building Assessment

M

COMPONENTSRATING SCALE

		HS	S+	S	S-	US
<u>Spatial</u>	91- Unit stations and layout	1	2	3	4	5
	92- Unit sizes (l x w x h)	1	2	3	4	5
<u>Sonic</u>	93- Quality of sound	1	2	3	4	5
	94- Noise control	1	2	3	4	5
<u>Thermal</u>	95- Climate control (HVAC)	1	2	3	4	5
	96- Energy sources and efficiency	1	2	3	4	5
<u>Visual</u>	97- Lighting adequacy/controllability	1	2	3	4	5
	98- Visual flexibility/efficiency	1	2	3	4	5
<u>Hygienic</u>	99- Personal care convenience	1	2	3	4	5
	100- Design features support for health	1	2	3	4	5
<u>Safety</u>	101- Hazard controls (fumes, fire, explosion) ...	1	2	3	4	5
	102- Structural-equipment conditions for safety ..	1	2	3	4	5
<u>Traffic-flow</u>	103- Internal movement(H/V people/equipment) ...	1	2	3	4	5
	104- External movement (people/vehicular)	1	2	3	4	5
<u>Equipment</u>	105- Public Utilities and Services	1	2	3	4	5
	106- Special equipment installations	1	2	3	4	5
<u>Structural</u>	107- Durability of structural envelope	1	2	3	4	5
	108- Design treatments	1	2	3	4	5
<u>Specifications</u>	109- Construction features overall adequacy	1	2	3	4	5
	110- Education features overall adequacy	1	2	3	4	5

Voc Ed facilities were make shift, and were not designed or renovated for present use. Layout is not function.

Climate control is typical of older buildings and not adequate by current standards. Lights can not be controlled according to area, and intensity can not be changed. There is no filtering or humidity system in the facility.

The building is not accessible by handicapped.

RATING SCALE

- HS - Highly Satisfactory (1)
- S+ - Satisfactory plus (2)
- S - Satisfactory (3)
- S- - Satisfactory minus (4)
- US - Unsatisfactory (5)

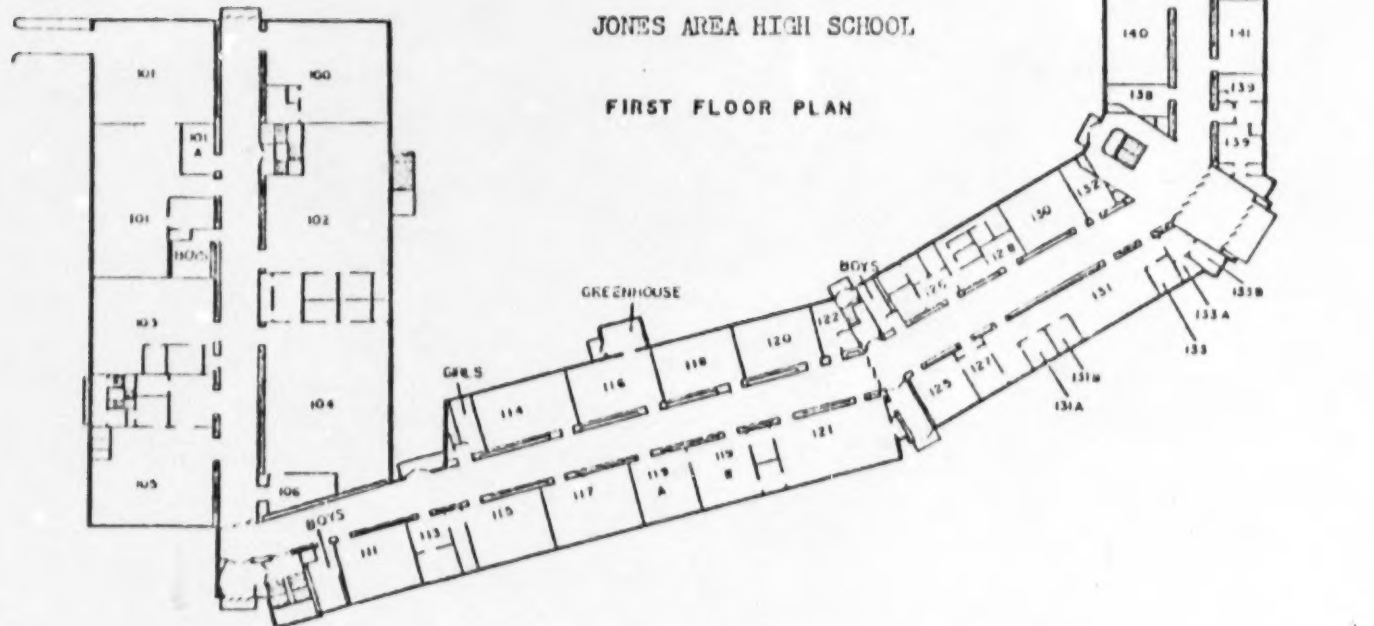


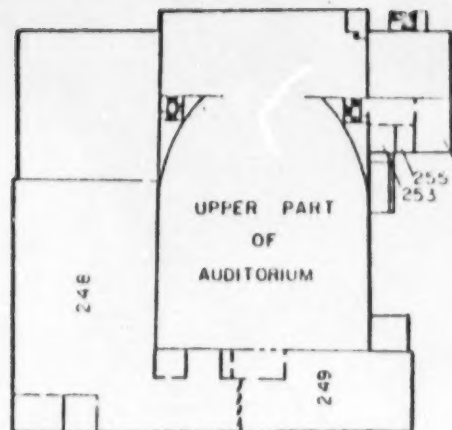
- 125 CONFERENCE ROOM
126B COUNSELING & PLACEMENT
127 PH. PAL'S OFFICE
131 MAIN OFFICE
131A VICE PRINCIPALS OFFICE
131B VICE PRINCIPALS OFFICE
132 FINANCIAL OFFICE
133 ATTENDANCE OFFICE
133A DEAN OF BOYS
133B DEAN OF GIRLS
138 SOCIAL SERVICE OFFICE
139 HEALTH CLINIC
140 PUBLICATIONS OFFICE



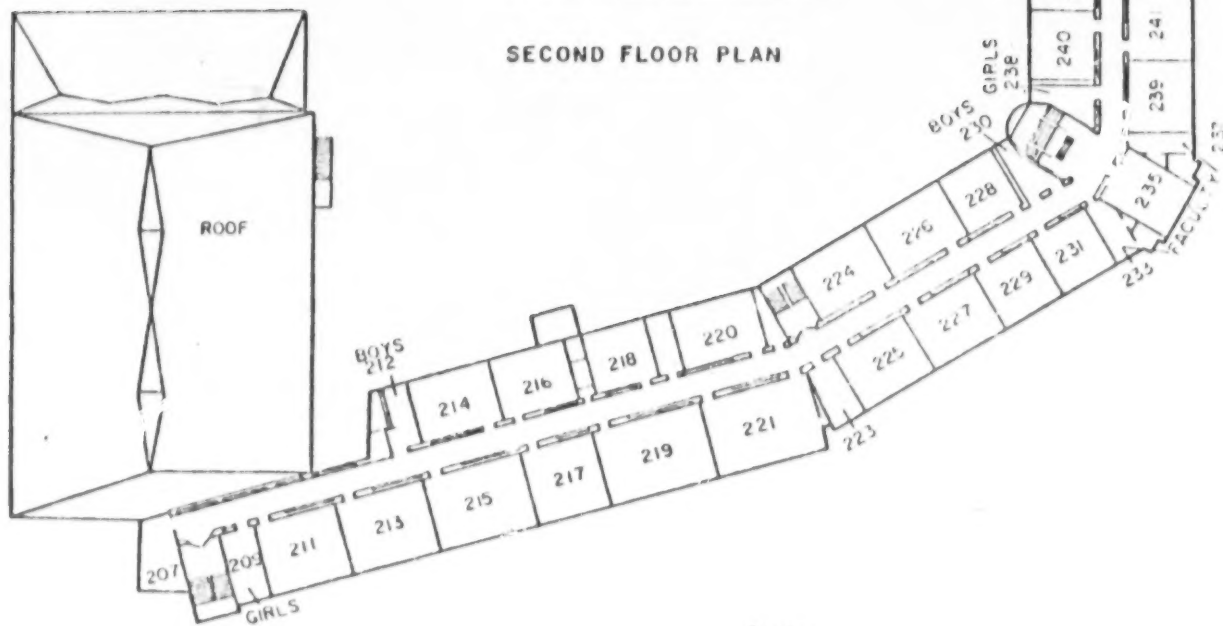
JONES AREA HIGH SCHOOL

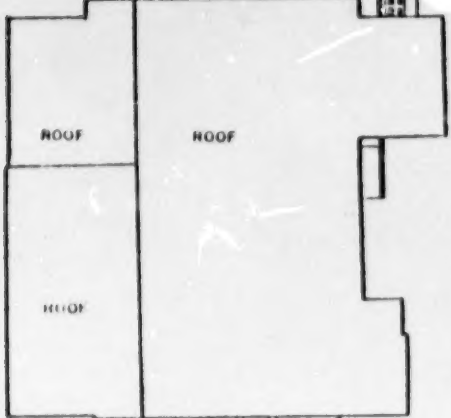
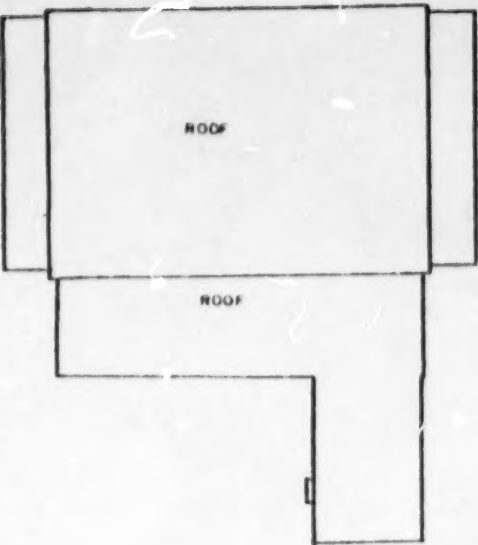
FIRST FLOOR PLAN





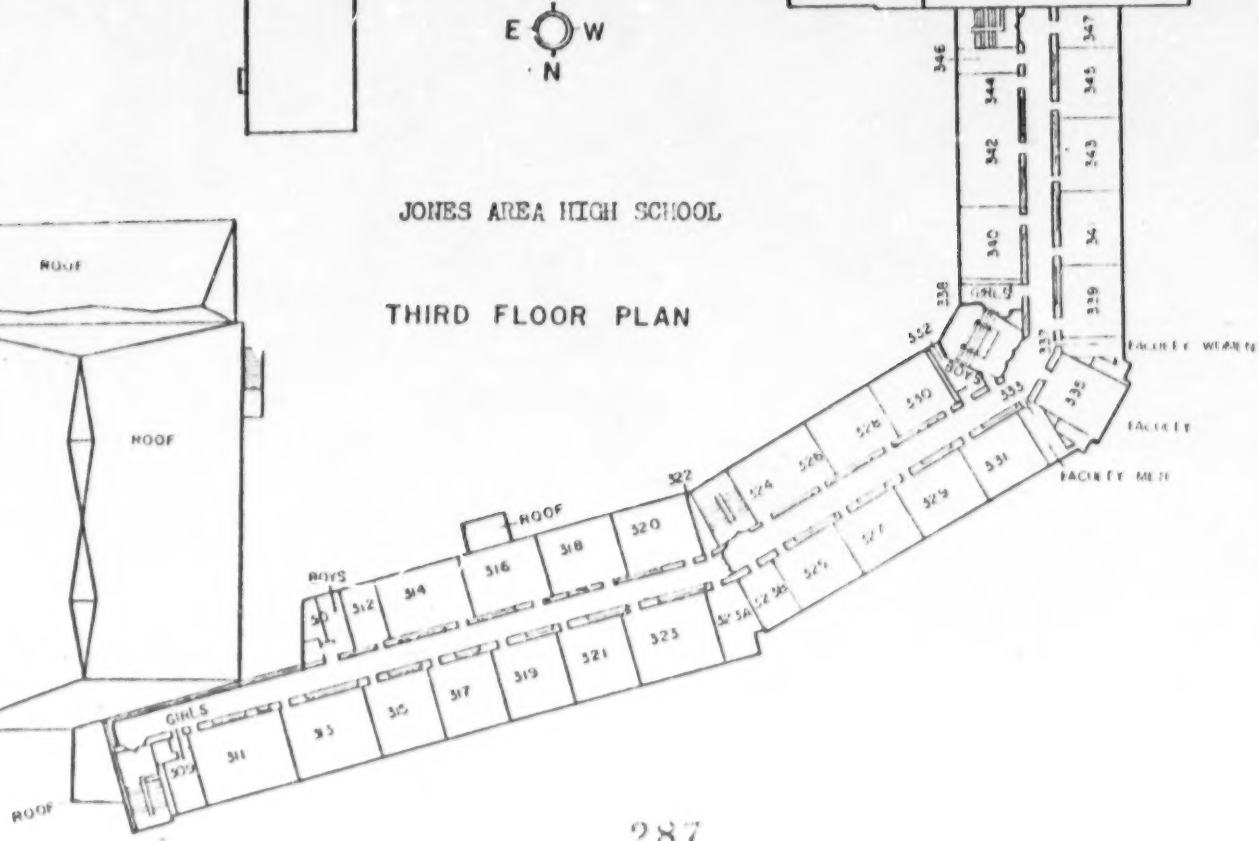
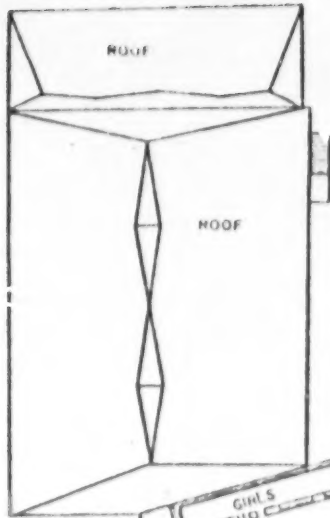
SECOND FLOOR PLAN





JONES AREA HIGH SCHOOL

THIRD FLOOR PLAN



KEY FOR CAFETERIA

- A MAINTENANCE STORAGE
- B STORE ROOM NO. 2
- C BAKE SHOP
- D STORE ROOM NO. 3
- E DISH ROOM
- F OFFICE
- G ICE MACHINE ROOM
- H DAIRY REF.
- J MEAT REF.
- K VEG. REF.
- L DEEP FREEZER
- M ANTI ROOM (THAWING)
- N JANITOR & ELEVATOR MACH.
- O SERVICE ELEVATOR
- P TRASH ROOM
- Q MEN'S TOILET
- R MEN'S LOCKERS
- S WOMEN'S TOILET
- T WOMEN'S LOCKERS
- U WOMEN'S REST ROOM
- V CLOSET
- W BOOKSTORE STORAGE
- X BOOKSTORE
- Y FACULTY DINING ROOM
- Z STORE ROOM NO. 1



JONES AREA HIGH SCHOOL

BASEMENT PLAN

NOTE 4' FT (SAME LEVEL AS ELEC EQUIP ROOM)

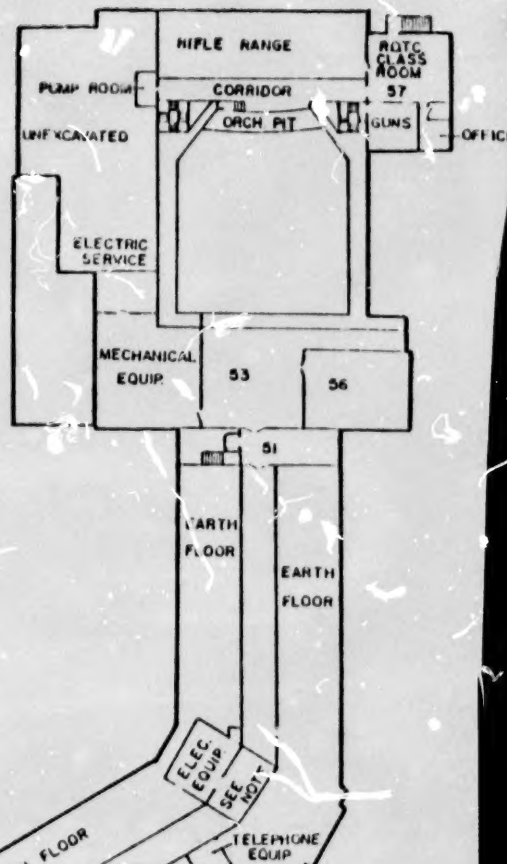
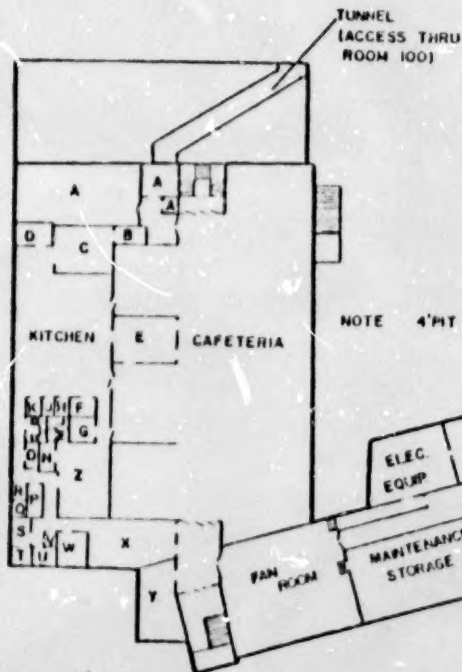
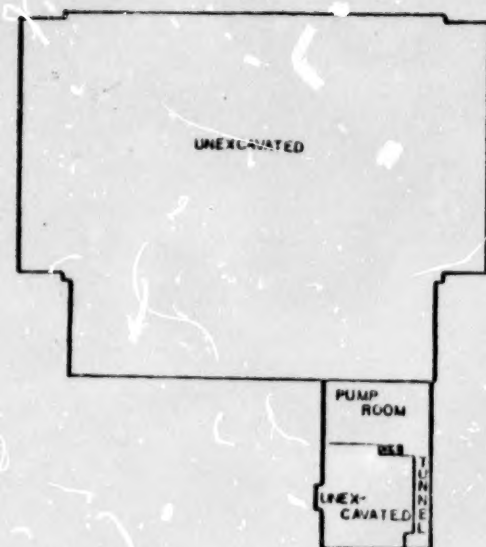


Exhibit VI. 2**Inspection Form - Alternative Answers**

EXHIBIT

Institution

Identification

Station Number
 Number Student Stations

Spatial Features

Type (Clrm, Lab, Shop)
 Size (area)
 Width
 Length
 Height
 Storage (w x l)

Construction Features

Treatments (interior)

Floor 1) No Slip, 2) Tile, 3) Carpet, 4) Other
 Wall 1) Scrubbable, 2) Acoustic or Carpet, 3) Other
 Ceiling 1) Acoustic, 2) Plaster, 3) Exposed, 4) Other

Structural System

Framing 1) Mason, 2) Steel, 3) Other
 Wall 1) Mason, 2) Other

Doors

Overhead (w x h)
 Exterior (w x h)
 Interior (w x h)

Windows

Window area
 Height off floor

Electrical FeaturesLighting

Type fixtures 1) Fluorescent, 2) Incandescent, 3) Other
 Number switches
 Light scheme 1) Overhead Glare Free, 2) Task Lights, 3) Combination, 4) Other

PowerWall outlets

No. outlets
 Height/space
 Voltage(s) 1) 110, 2) 220, 3) Combination

Machine outlets

No. outlets
 Service (clng./flr.) 1) Ceiling, 2) Floor, 3) Combination, 4) Other, 5) None
 Voltage(s) 1) 110, 2) 220, 3) 110G, 4) Combination, 5) Other
 No. outside outlets 1) Yes, 2) No
 Master control 1) Yes, 2) No
 Panic button 1) 1, 2) 2, 3) None

Electronic Features

Intercom (1w, 2w, o) 1) 1 Way, 2) 2 Way, 3) None
 Telephone service 1) Yes, 2) No
 TV service 1) Yes, 2) No
 Electronic sensors 1) Yes, 2) No

Mechanical Features

HVAC Systems

Energy source(s) 1) Gas, 2) Electric, 3) Other _____
Type heat system 1) Boiler, 2) Space/Area, 3) Other _____
Station regulation of HV ... 1) Yes, 2) No _____
Air conditioned 1) Yes, 2) No _____

Plumbing service

Water service THE REMAINDER OF THE QUESTIONS ARE YES/NO _____
Drinking fountain _____
Lavatory _____
Floor drain(s) _____
Hose bibs _____
Outside water service _____

Gas Service

Availability _____
Type service _____
No. gas outlets _____
Master control _____

Compressed air service

Availability _____
No. disconnect outlets _____
Outside air service _____

Health and Safety Features

Health

Convenient restrooms _____
Lockers available _____
Convenient drinking fountain _____
Convenient hand washing _____
Dust-fume removal _____
Special ventilation _____

Safety

Fire ext. available _____
Sprinkler system _____
Exit markings _____
Alarm system _____
Clear traffic lanes _____
Good security _____

Barrier Free Features

Special equipment _____
Equipment operability _____
Adequate entrances-exits _____
Adequate H-V movement _____

Special Equipment Features

Specify _____
Specify _____
Specify _____

Other Feature(s)

Specify _____

by: _____

date: _____

Exhibit VI.3
Site Sample ID Coding Sheet (Example)

SITE SAMPLE ID CODE

Name of School	ID Code			
	County	Corporation	Bl'dg. No.	Economic Region
Warren Career Center	49	5360	5363	8
J. Everett Light Career Center	49	5370	5450	8
Arsenal Technical High School	49	5385	5469	8
Franklin Central High School	49	5310	5193	8
Lawrence North High School	49	5330	5276	8
Arlington High School	49	5385	5465	8
Emmerich Manual High School	49	5385	5481	8
John Marshall High School	49	5385	5483	8
Northwest High School	49	5385	5494	8
Fort Wayne Regional Vocational Center	02	0235	0093	3
Anderson Area Vocational-Technical School	48	5275	5145	6
Mid Central Area Vocational School	48	5280	5175	6
Upper Wabash Vocational School	85	8065	9903	5
Muncie Area Career Center	18	1970	1422	6
Elkart Area Career Center	20	2305	1751	2
R. Nelson Snider High School	02	0235	0102	3
Eastbrook High School	27	2815	2293	6
New Palestine High School	30	3115	2565	8
Mount Vernon High School	30	3135	2569	8
Eastern Jr.-Sr. High School	34	3480	2919	5
Warsaw Freshman High School	43	4415	3649	2

Name of School	ID Code			
	County	Corporation	Bldg. No.	Economic Region
El-Tip-Wa Area Vocational School	09	0875	0739	5
Gary Area Career Center	45	4690	4151	1
A. K. Smith Area Career Center	46	?	6948	1
Hammond Technical Vocational High School	45	4710	4201	1
Western Boone Jr.-Sr. High School	06	0615	0539	8
Delphi Community High School	08	0755	0637	4
Rochester Community High School	25	2645	2173	5
Culver Community High School	50	5455	5245	2
South Newton Jr.-Sr. High School	56	5995	6417	1
Chesterton Sr. High School	64	6470	6925	1
North Lawrence Area Vocational Technical Center	47	5075	4931	10
South Central Area Vocational School	13	1305	1063	14
Central Nine Vocational Technical School	41	4265	9909	8
Connersville Area Vocational School	21	2395	1923	9
Princeton Community High School	26	2735	2249	13
South Central High School	31	3190	2657	14
Bloomington High School South	53	5740	6166	10
Central High School	82	7995	8241	13
Eastern High School	88	8215	8905	14
Edinburg Community High School	41	4215	3447	8

Exhibit VI.4
Program Area/Course Identification
and ID Code

PROGRAM OFFERINGS
VOCATIONAL EDUCATION

Instructions: Please fill in all the information for your program offering for which you receive funds from the State Board of Vocational Education.

Program Cluster: Agribusiness

<u>U.S.D.E. Code</u>	<u>Program Name</u>	<u>Room Number</u>	<u>Student Station Capacity</u>
01.0100	Agriculture Production	_____	_____
01.0200	Agriculture Supplies/Services	_____	_____
01.0300	Agriculture Mechanics	_____	_____
01.0400	Agriculture Products	_____	_____
01.0500	Ornamental Horticulture	_____	_____
01.0600	Agriculture Resources	_____	_____
01.0700	Forestry	_____	_____
01.9900	Other _____	_____	_____
	Please list		

Program Cluster: Business and Office Education

<u>Program Name</u>	<u>Room Number</u>	<u>Student Station Capacity</u>
4.0100 Accounting and Computing Occupations	_____	_____
4.0200 Business Data Processing Systems Occupations	_____	_____
4.0201 Computer and Console Operators	_____	_____
4.0203 Programmers	_____	_____
4.0300 Filing, Office Machine, Clerical Occupations	_____	_____
4.0400 Information Communication Occupations	_____	_____
4.0500 Materials Support, Transportation, Etc.	_____	_____
4.0600 Personnel Training and Related Occupations	_____	_____
4.0700 Stenographic, Secretarial, and Related Occupations	_____	_____
4.0800 Supervisory and Administrative Management Occupations	_____	_____
4.0900 Typing and Related Occupations	_____	_____
4.9900 Other _____	_____	_____
	Please list	

Program Cluster: Distributive Education

<u>Program Name</u>	<u>Room Number</u>	<u>Student Station Capacity</u>
4.0100 Advertising Services	_____	_____
4.0200 Apparel and Accessories	_____	_____
04.0300 Automotive	_____	_____
04.0400 Finance and Credit	_____	_____
4.0500 Forestry	_____	_____
04.0600 Food Distribution	_____	_____
04.0700 Food Services	_____	_____
4.0800 General Merchandise	_____	_____
4.0900 Hardware, Building Material	_____	_____
04.1000 Home Furnishings	_____	_____
4.1100 Hotel and Lodging	_____	_____

Program Cluster: Distributive Education Cont.

<u>U.S.D.E. Code</u>	<u>Program Name</u>	<u>Room Number</u>	<u>Student Station Capacity</u>
04.1200	Industrial Marketing		
04.1300	Insurance		
04.1400	International Trade		
04.1500	Personnel Service		
04.1600	Real Estate		
04.1700	Recreation and Tourism		
04.1800	Transportation		
04.1900	Retail Trade, Other		
04.9900	Other _____		
	Please list		

Program Cluster: Health Occupation

<u>Program Name</u>	<u>Room Number</u>	<u>Student Station Capacity</u>
07.0101 Dental Assistant		
07.0103 Dental Laboratory Technology		
07.0203 Medical Laboratory Assisting		
07.0299 Other Medical Laboratory		
07.0302 Practical (Vocational) Nursing		
07.0303 Nursing Assistant (aide)		
07.0305 Surgical Technology		
07.0399 Other Nursing		
07.0401 Occupational Therapy		
07.0402 Physical Therapy		
07.0501 Radiologic Technology		
07.0700 Environmental Health		
07.0800 Mental Health Technology		
07.0903 Inhalation Therapy		
07.0904 Medical Assistant		
07.0906 Health Aide		
07.0907 Medical Emergency Technician		
07.9900 Other _____		
Please list		

Program Cluster: Home Economics

<u>Program</u>	<u>Room Number</u>	<u>Student Station Capacity</u>
09.0102 Child Development		
09.0103 Textiles and Clothing		
09.0104 Consumer Education		
09.0105 Family Health		
09.0106 Family Relations		
09.0107 Foods and Nutrition		
09.0108 Family Management		
09.0109 Housing and Home Furnishings		
09.0201 Care and Guidance of Children		
09.0202 Clothing Management, Production and Services		
09.0203 Food Management, Production and Services		
09.0204 Home Furnishings, Equipment and Services		
09.0205 Institutional and Home Management Services		
09.0299 Other _____		
Please list		

Program Cluster: Trade and Industrial Education

U.S.D.A.

Code

Program NameRoom NumberStudent StationCapacity

17.0100	Air Conditioning		
17.0200	Appliance Repair		
17.0301	Body and Fender Repair		
17.0302	Auto Mechanics		
17.0399	Other Automotive		
17.0400	Aviation Occupations		
17.0500	Blueprint Reading		
17.0600	Business Machine Maintenance		
17.0700	Commercial Art Occupations		
17.1001	Carpentry-Building Trades		
17.1002	Electricity		
17.1004	Masonry		
17.1007	Plumbing and Pipefitting		
17.1099	Other Construction and Maintenance		
17.0900	Commercial Photography Occupations		
17.1100	Custodial Service		
17.1200	Diesel Mechanic		
17.2302	Machine Shop		
17.2303	Machine Tool Operation		
17.2305	Sheet Metal		
17.2306	Welding and Cutting		
17.2307	Tool and Die Making		
17.2399	Other Metalworking Occupations		
17.1300	Drafting Occupations		
17.1400	Electrical Occupations		
17.1500	Electronic Occupations		
17.1600	Fabric Maintenance Services		
17.1700	Foremanship, Supervision, and Management		
17.1900	Graphic Arts Occupations		
17.2400	Metallurgy Occupations		
17.2601	Barbering		
17.2602	Cosmetology		
17.2700	Plastics Occupations		
17.2801	Fireman Training		
17.2802	Law Enforcement Training		
17.2900	Quantity Food Occupations		
17.3000	Refrigeration		
17.3100	Small Engine Repair		
17.3300	Textile Production and Fabrication		
17.3400	Leather Working		
17.3500	Upholstry		
17.3600	Woodworking Occupation		
17.9900	Other		

Please List

Please list any voactional programs for Handicapped and Disadvantaged offered in this facility.

Exhibit VI.5

Special Equipment by Program Area

Special Equipment and Features: Agribusiness Education

Program:	Greenhouse	Yes	No	Comment
1.	Soil bins for potting soil	☐	☐	
2.	Lighting is moisture proof	☐	☐	
3.	Electrical outlets are moisture proof	☐	☐	
4.	Misting system	☐	☐	
5.	Refrigerated display case	☐	☐	
Program:	General classes and laboratories			
1.	Nursery plat has irrigation system	☐	☐	
2.	Lighted display case	☐	☐	
3.	Acid resistant sink and plumbing	☐	☐	
4.	Exhaust system for welding	☐	☐	
5.	Exhaust system for paint spray area	☐	☐	
6.	Outside fenced in shop area of size _____	☐	☐	
7.	Shop has one ton monorail chain hoist	☐	☐	
8.	Light intensity-50 fc at desk level	☐	☐	
9.	Light intensity-40 fc in shop areas	☐	☐	

Special Equipment and Features: Business and Office Education

Program:	Yes	No	Comments
1. Telephone jacks for computer terminals	_____	_____	_____
2. Raised floor in computer room	_____	_____	_____
3. Lighted display area	_____	_____	_____
4. Light intensity-50 fc at desk level	_____	_____	_____
5. Glass windows between data entry and computer center	_____	_____	_____
6. Acoustically treated space	_____	_____	_____

Special Equipment and Features: Distributive Education

Program: General Classrooms and labs	Yes	No	Comments
1. Accoustically treated	_____	_____	_____
2. Light intensity-50 fc at desk level	_____	_____	_____
3. Lighted display case	_____	_____	_____

Special Equipment and Features: Health Occupations

Program: General Lab and Classrooms	Yes	No	Comments
1. Acoustically treated	_____	_____	_____
2. Light intensity--50 fc at desk level	_____	_____	_____
3. Special exhaust duct for laboratory work station	_____	_____	_____
4. Lighted display window	_____	_____	_____
Program: Dental Occupation			
1. Dark room with sink	_____	_____	_____
2. X-ray lab area with lead shield in walls	_____	_____	_____

Special Equipment and Features: Home Economics Education

	Yes	No	Comments
Program: Care and Guidance of Children			
1. Drinking fountain for children	_____	_____	_____
2. Outside play area	_____	_____	_____
a. Hard Surface	_____	_____	_____
b. Sod	_____	_____	_____
3. Washable wall surface	_____	_____	_____
4. Special toilets for children	_____	_____	_____
5. Classroom on ground level	_____	_____	_____
Program: Home Economics Lab and Classroom			
1. Garbage Disposal Unit in Sinks	_____	_____	_____
2. Dishwashers	_____	_____	_____
3. Outside vents for clothes dryers	_____	_____	_____
4. Floor drains in laundry area	_____	_____	_____
5. Light intensity--50 fc at desk level	_____	_____	_____
6. Future Homemakers of America mailing area	_____	_____	_____
7. Easy access to receiving area	_____	_____	_____
Program: Food Management Production and Services			
1. Walk-in refrigeration storage of ____ sq.ft.	_____	_____	_____
2. Outside entrance	_____	_____	_____
3. Rest rooms--male and female	_____	_____	_____
4. Locker room	_____	_____	_____

Special Equipment and Features: Trade and Industrial Education

Program:	Yes	No	Comments
Program: Auto Body and Fender			
1. A Bay for washing vehicles			
2. Paint booth exhaust system			
3. Fenced in outside area			
4. 16' x 24' drive-in paint spray booth			
5. Frame alignment equipment			
6. Monorail and chain hoist			
Program: Auto Mechanics			
1. Fenced outside area			
2. Ventilation system for carbon monoxide			
3. Floor drain gutter with grille full length of shop			
4. Hydraulic automobile lift			
Program: Building Trades			
1. Mobile unit			
Program: General Shop Areas			
1. Acoustically treated			
2. Light Intensity			
70 fc in classrooms			
100 fc in drafting, general assembly room, etc.			
150 fc in inspection, testing areas			
3. Dust collection in wood shop and grinding areas			
Program: Welding			
1. Secured outside cylinder storage area			
2. Gas manifolds in shop area			
Program: Machine trade			
1. Monorail and chain hoist			
2. Electrical busduct overhead			
110			
220			
3. Special gas supply for heat treat			
Program: Radio and TV repair			
1. Copper screen in all walls for interference protection			

APPENDIX VII

SELECT BIBLIOGRAPHY
FOR
VOCATIONAL EDUCATION FACILITIES

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